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AMERICAN ANTIQUITY

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# ARCHAEOLOGICAL INVESTIGATIONS IN SOUTHWESTERN ALASKA

HELGE LARSEN

DESPITE considerable activity during the last two decades our knowledge of the archaeology of Alaska is still rather scanty. Very few places have been thoroughly investigated, and almost all work has been confined to two areas, a northern including St. Lawrence Island and a southern including the Aleutian Islands. The intermediate area, from Wales to Port Möller, with a coast line of approximately 2000 miles, is virtually unknown from an archaeological point of view. If archaeological material from this area exists in museum collections, it is unpublished and thus useless to most students.

The need of information about the archaeology of this part of Alaska was felt very badly by the writer during his work on the analysis of the Ipiutak culture.[1] When it became apparent that early Kachemak Bay culture must belong to the same Paleo-Eskimo complex as Ipiutak, it was natural to assume the former existence of the same complex in the intermediate area, an assumption which ethnological evidence seems to bear out.[2] However, ethnological evidence does not carry the same weight as archaeological, and it was in the hope of finding the latter and filling in at least a part of the gap in our knowledge that the writer in the summer of 1948 began investigations in the Bristol Bay-Kuskokwim Bay area. The project, which was supported by the Arctic Institute of North America with funds provided by the Office of Naval Research and by the Danish Expedition Fund, was coordinated with another in Norton Sound headed by Professor J. L. Giddings, Jr. of the University of Alaska.[3] Dr. Erik Holtved of the University of Copenhagen and Owen E. Rye, a senior at the University of Alaska, were members of the writer's party, the main task of the former being a study of the Eskimo language.

Archaeological work in this part of Alaska is greatly hampered by the lack of local labor, as virtually all able-bodied men are occupied by the salmon fisheries during part of the digging season. For the same reason we had to give up our original plan of reconnoitering the coast by boat and used aeroplanes instead. This method turned out to have many advantages; it is faster, more efficient, and cheaper than reconnaissance carried out by boat and is therefore recommended for future work in Alaska. From an altitude of about 800 ft. the sites are very conspicuous, and, since the relative age of the ruins can be read from the vegetation, which in the late ruins is very luxuriant and dark green and in the old ruins is low and sometimes as heathery as the surrounding terrain, it is easy to pick out the sites that look promising. To the writer it seemed logical to look for sites located like Ipiutak on low sand and gravel spits, a reasoning which eventually gave a positive result. Out of 50 sites observed from the air or reported by local people, seven were investigated although only minor parts of them were excavated. A brief description of the seven sites and the material found in them follows in the order in which they were investigated. As the material has not yet been thoroughly studied this must be considered as a preliminary report of our observations.

*Pávik.* On our way to Dillingham from Anchorage we were grounded for five days because of stormy weather at Naknek on the east side of Bristol Bay. This unintentional stop gave us a chance to do a little digging at Pávik, the former location of the present Naknek village

[1] Larsen and Rainey, 1948.

[2] Larsen and Rainey, 1948, p. 154.

[3] Giddings, 1949.

half a mile further up the Naknek River, which is known from Hrdlička's investigations in 1931.[4] According to the local postmaster, who has lived in Naknek since 1895, Pávik was abandoned 20 years before his arrival; hence the Pakvik mentioned in the 11th census (1890) might be the present Naknek village.[5] The site, situated on a high bluff at the river, consists of several fairly well preserved ruins covered by very high and thick grass. The ruins are square or rectangular, 5 by 5 to 5.5 by 6.5 m. with the longest extension at right angles to the entrance. This is from 2.5 to 3 m. long with an anteroom in front, approximately 2 m. square.

Because of frost in the ruins an area of 16 sq. m. was excavated half way down the steep river bank, where a 1 m. thick layer of refuse had accumulated. Besides fish bones, shells, and bones of seal, beluga, caribou, bear, beaver, and moose the refuse contained a considerable number of artifacts, mostly potsherds but also objects of slate, antler, bone, and ivory. The potsherds are rather thin, 0.5–0.8 cm., harder and less coarse-grained than most Eskimo pottery. The vessels were plain with a flat bottom, almost straight sides, and a thin rim. Notable among the many ground slate objects are triangular arrow points and harpoon blades with a very thin, sharply cut, triangular mid-section (Fig. 55, *A*, *14*, *15*). Many cut pieces of slate indicate the use of a stone saw, although none were found. Some of the best preserved antler and ivory objects such as harpoon head and foreshaft, harpoon-arrowhead, nozzles for bladders, dart head, arrowhead, leister prong, bird arrowhead, fishhook, and a human figure are shown in Figure 55, *A*, *1–11*. In addition the finds include fragments of flat sled-shoes of whalebone; antler spoons, one of them with a fantastic human face engraved on the back; and some crudely carved, wooden human heads. The presence of several blue, red, and white glass beads (Fig. 55, *A*, *12*, *13*), fishhooks with an iron barb, and some iron tools indicate that the finds must be fairly recent. The same type of harpoon head was used by natives from Naknek fifty years ago, the only difference being that the blade was made of brass; hence, the finds probably date from the nineteenth century.

*Dillingham.* Two sites were found near Dillingham, one on Snag Point at the east end of the present Dillingham village, the other half a mile north of Snag Point. The latter, which was tested, is situated on an old river bank now separated from the river by a low, quarter-mile wide, grassy plain. This large site, which was covered by tall grass, willows, and some spruce trees, consists of many house pits, some of them very large and deep. Five houses were tested, but as they were excavated in sand, only a paper-thin culture layer with a few potsherds and stone implements was found. The potsherds are extremely thick (2–3 cm.) and coarse grained and must have belonged to very large vessels with flat bottoms. The stone implements include blades for lances, knives and ulos of ground slate, a grinding slab, and two heavy, grooved splitting adzes similar to those found by de Laguna in Cook Inlet and placed by her in Kachemak Bay III (latter half?).[6] The site is undoubtedly pre-white, but judging from the vegetation and state of preservation of the ruins it probably does not date back further than the seventeenth century.

*Platinum South Spit.* Attracted by the topography of the two long and narrow sand spits which separate Goodnews Bay from Kuskokwim Bay, and by the fact that a large site was observed on each of the sand spits, we decided to move from Dillingham to Platinum. Like Point Hope the spits consist of several long, low, parallel ridges of sand and gravel, undoubtedly old beach lines. Of the two sites, each situated near the point of the spit at the entrance to Goodnews Bay, the one on the South Spit is the larger. It consists of a maze of depressions of different sizes, partly covered by tall grass, which makes it impossible to determine the exact number of ruins except by excavating the entire site. We estimated that there were 150 house ruins, which places this site among the largest on record in Alaska.

The houses were built on four of the beach lines, and judging from their state of preservation, they seem to be contemporaneous or at any rate to date from a rather limited period of time. Most of the house pits are square or rectangular and have an entrance passage usually pointing north, sometimes with an anteroom. A few houses seem to consist of two rooms, one behind the other, connected with a passage. Owing to the poor state of preservation and the thinness of the culture layer, little can be said about the construction of the houses. The best preserved

[4] Hrdlička, 1943, pp. 350–1 and 386–8.

[5] Porter, 1893.

[6] De Laguna, 1934, Pl. 18, *1*, *2* and p. 172.

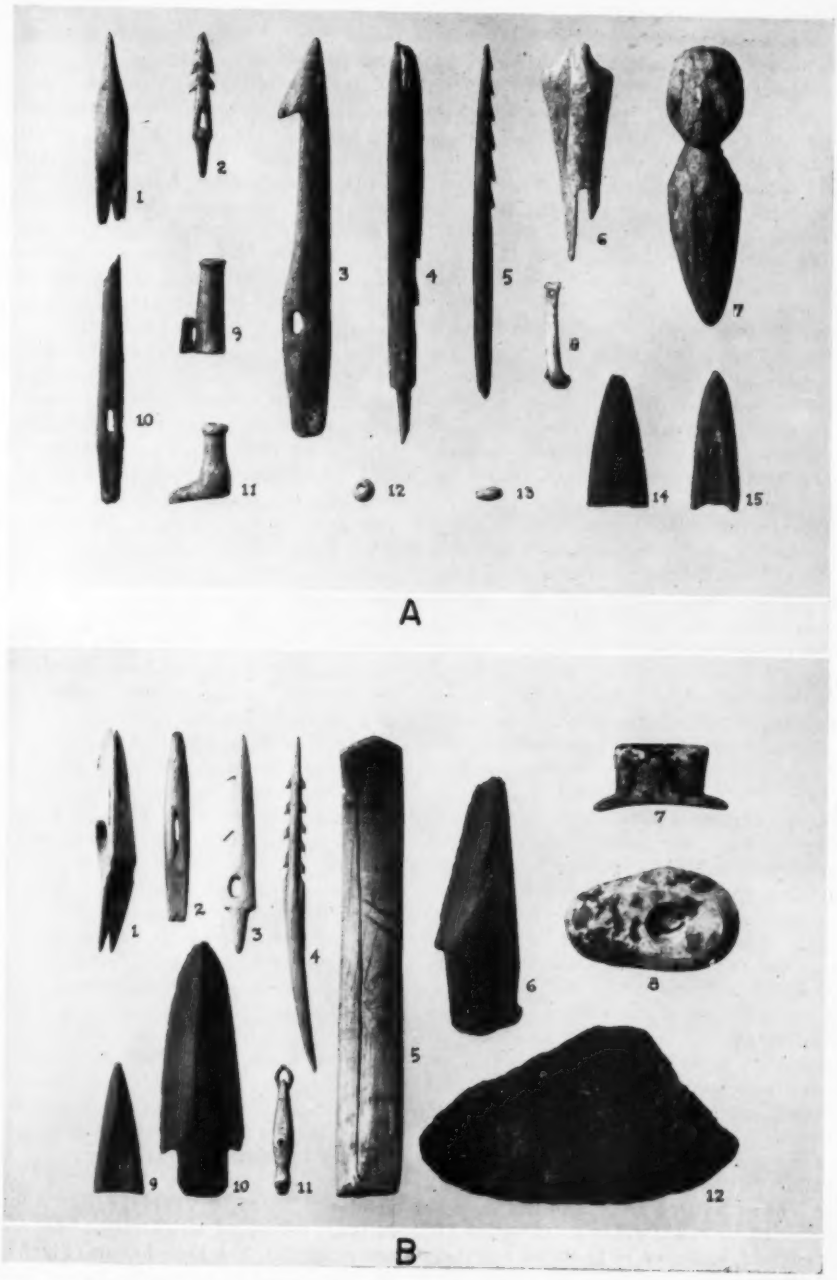


FIG. 55. Artifacts from Pávik (*A*) and Platinum South Spit (*B*), southwestern Alaska.

of the excavated houses was 4 m. square with a 3 m. long entrance passage in the west wall. The bottom of the passage, which extended 0.6 m. into the house, was 0.6 m. below the house floor. In the center of the floor consisting of hard packed sand was a round fireplace, 0.75 m. in diameter. Part of the south wall, a row of vertical planks or split logs was still visible, although the wood was badly decayed. Remains of four rather thin posts were found near the west and east wall. The discovery by local diggers of human skeletons in some of the houses may have given rise to the story that people from the North Spit had killed their neighbors on the South Spit. We found skeletons in five ruins, but the fact that most of the skeletons were lying in a flexed position with the head in the same direction (east), and in some cases with many implements nearby, which looked like grave goods, seems to indicate regular burials.

Apart from the artifacts found with the skeletons the finds from the houses were so poor that they did not warrant the effort of removing the thick and extremely tough sod layer which covered all the ruins. Meanwhile, in between the ruins were several deposits of shells, mostly mussels, which also contained a large number of animal bones and artifacts made of bone, antler, and walrus ivory in a perfect state of preservation. Two of these middens, covering 64 sq. m., were excavated and yielded more than 2000 specimens. The find is dominated by potsherds and objects of ground slate. Although not thoroughly examined, the pottery appears to be rather uniform as far as ware, shape, and decoration is concerned. The pots were flat-bottomed with slightly flaring sides, a rather faint shoulder, and a slightly constricted neck, which flares to the mouth; they are, in other words, the situla-shaped pots which de Laguna considers characteristic of the whole area between Bristol Bay and Norton Sound.[7] Like the pottery described by de Laguna the ware is coarse, tempered with gravel and grass, and inclined to exfoliate, especially in a thin layer applied to the outside after the pot was shaped. Encircling lines and a row of dots were also used as decoration, but with this the similarity at least to the Yukon pottery ends. The rim may be flat, rounded, or ∧-shaped in cross section but never grooved, scalloped, or knopped, and there are never grooves or ridges on the inside. Like the pottery described from Kuskokwim and Togiak rivers,[8] most Platinum pots are more squat in proportion than the Yukon specimens and are also decorated further down the sides than these. A common decorative motive is a fine, vertical or oblique striation, which might have been made with a comb. Most of the sherds, which average 1 cm. in thickness, are black; some are tan or greyish brown on the outside. Only a couple of lamps were found and none of them fired. They are small, saucer-shaped, thick bottomed and made of grey, clay. The bowl is black from burning, which shows that they were used unfired.

The most common types of slate implements are triangular harpoon (and arrow?) blades, slender, double-edged (lance?) blades, and knife and ulo blades, as shown in Figure 55, *B*. Adze blades, drill bits, and drill rests (Fig. 55, *B, 8*) were made of silicified slate and other hard minerals. Saws of fine-grained sandstone were used for cutting slate. No flint chips or chipped stone implements were found. The implements of antler, bone, and ivory are reminiscent of those found at Pávik. The toggle harpoon heads have a closed shaft socket, two spurs, and a blade-slit at right angles to the line hole. The small, slender foreshafts have a wedge-shaped tang, which means that the long socket-pieces must have had a wooden plug with a slit in the socket. More common than toggle harpoon heads are small, barbed heads for darts or harpoon arrows. The arrowheads are furnished with a blade slit and a plain, conical tang. Fishing must have played an important rôle. The middens contained in places thick layers of fish bones, and fine, barbed prongs for fish spears are among the most common artifacts. There were no indications of the use of fishhooks and nets. Judging from the bone refuse, seal, caribou, beluga, and birds were the most important game. A number of labrets were found, most of them of ivory and similar in shape to the most common form in the Aleutians. The stone labret illustrated in Figure 55, *B, 7* was found on the lower jaw of one of the skeletons, the teeth of which were worn by the use. Objects of art are limited to a few animal carvings, of which a seal-shaped pendant (Fig. 55, *B, 11*) is the best. A few artifacts are decorated with straight lines and concentric circles. The knife handle (Fig. 55, *B, 5*) must have had an iron blade, but no iron tools

[7] De Laguna, 1940, p. 69, and 1947, pp. 227–8.

[8] De Laguna, 1947, p. 228.

or glass beads were found. The find is probably pre-contact, but the similarity with the find from Pávik does not indicate great age.

*Platinum North Spit.* The site on the north side of the entrance to Goodnews Bay consists of approximately 60 house ruins and corresponds in all respects to the one on the south side. The houses, which have been built on an old beach line, are covered by tall grass, and the few that were investigated contained the same types of implements. A skeleton, tightly flexed and with the head towards east, was found in one of the houses. Middens with great quantities of shells and containing well preserved artifacts of the same types as on the South Spit, were found in many places, and about 370 specimens were secured.

*Chagvan Bay.* Of the sites observed on reconnaissance flights from Platinum, one in particular attracted our attention. It is situated on the south side of the entrance to Chagvan Bay, 18 miles south of Platinum, where a low, triangular peninsula projects from the highland which terminates in Cape Newenham. This flat piece of land is built up of rows of parallel gravel ridges covered by a vegetation of Empetrum except for a fringe of green grass along the entrance to the bay. As at Platinum the green area was dotted with square holes, but here round holes were also observed outside this area. Tempted by the appearance of the latter we investigated the site and found that they, as we expected, were house ruins older than the rest. The site consists of about 50 houses which, judging from the vegetation and the state of preservation, represented at least four different periods of habitation. The latest houses, probably inhabited in 1880, when 48 people lived at Tzahavagamute, as the place was then called,[9] are square with vertical sod walls and are covered by tall grass. Others with the same kind of vegetation but with fallen-in walls are reminiscent of the houses at Platinum and probably contemporary with those. The next stage is represented by saucer-shaped depressions covered by short grass and herbs, and finally there were the rounded depressions with the Empetrum vegetation. We concentrated our efforts on the latter, and despite the fact that only stone and pottery were preserved, it soon became obvious that these houses belong to a culture different from that we had hitherto found. Instead of pieces of ground slate and brittle, crude potsherds we found chipped flint implements and pottery of a much harder and finer ware.

The flint industry is definitely reminiscent of Ipiutak. On Figure 56, *A* we may find Ipiutak types like arrow point, insert blade, harpoon blade, end blade of Type 3, drill of Type 2, side blade, semilunar blade, and side scraper with concave edge.[10] The chipping is generally not as fine as on the Ipiutak specimens, but that may partly be due to inferior material. Some types, like arrow points with an indication of a tang (Fig. 56, *A*, *2*, *3*) and knife blades with a notch near one end (Fig. 56, *A*, *11–13*) did not occur at Ipiutak. In the find from Chagvan Bay there are also numerous rubbed pieces of pumice and notched flat stones, probably net-sinkers (Fig. 56, *A*, *17*). The latter, which are usually notched at the ends, rarely at the sides, average about 6 cm. in length, and thus belong to a type which is very common in Kachemak Bay II.[11] The only ground stone implements found are adze blades, most of them flat with a rounded butt; whetstones; and labrets. Medial as well as lateral labrets were used. Figure 56, *A*, *18* shows an exceptionally well made medial labret with a narrow, rectangular plate and a curved base, which fits the front part of the lower jaw. Both kinds of labrets occur in the Kachemak Bay culture.[12]

In one point in particular does this find deviate from the Ipiutak culture, and that is in the presence of pottery. One of the old Chagvan Bay houses yielded no less than three different types of potsherds, a thick, a thin plain, and a check-stamped. All three kinds are much harder and of finer material than ordinary Eskimo pottery. They are well fired and tempered with sand(?), grass, and possibly gravel. The small, rounded pebbles in the paste are so few and far between that they might have got into the clay by accident, but this and other questions regarding this pottery cannot be settled until it has been properly analyzed. The following description is based upon a rather superficial, macroscopic examination. The thick, plain sherds probably came from large, flat-bottomed vessels with straight sides and a rounded rim. They are reddish or greyish brown on the outside, usually with a black core, and grey, black, or brown on the inside. Their average thickness

[9] Petroff, 1884, p. 17.

[10] Larsen and Rainey, 1948, Pls. 2, 12, 14, 16, and 20.

[11] De Laguna, 1934, p. 122 and Pl. 16.

[12] De Laguna, 1934, Pl. 51, *28* and *31*.

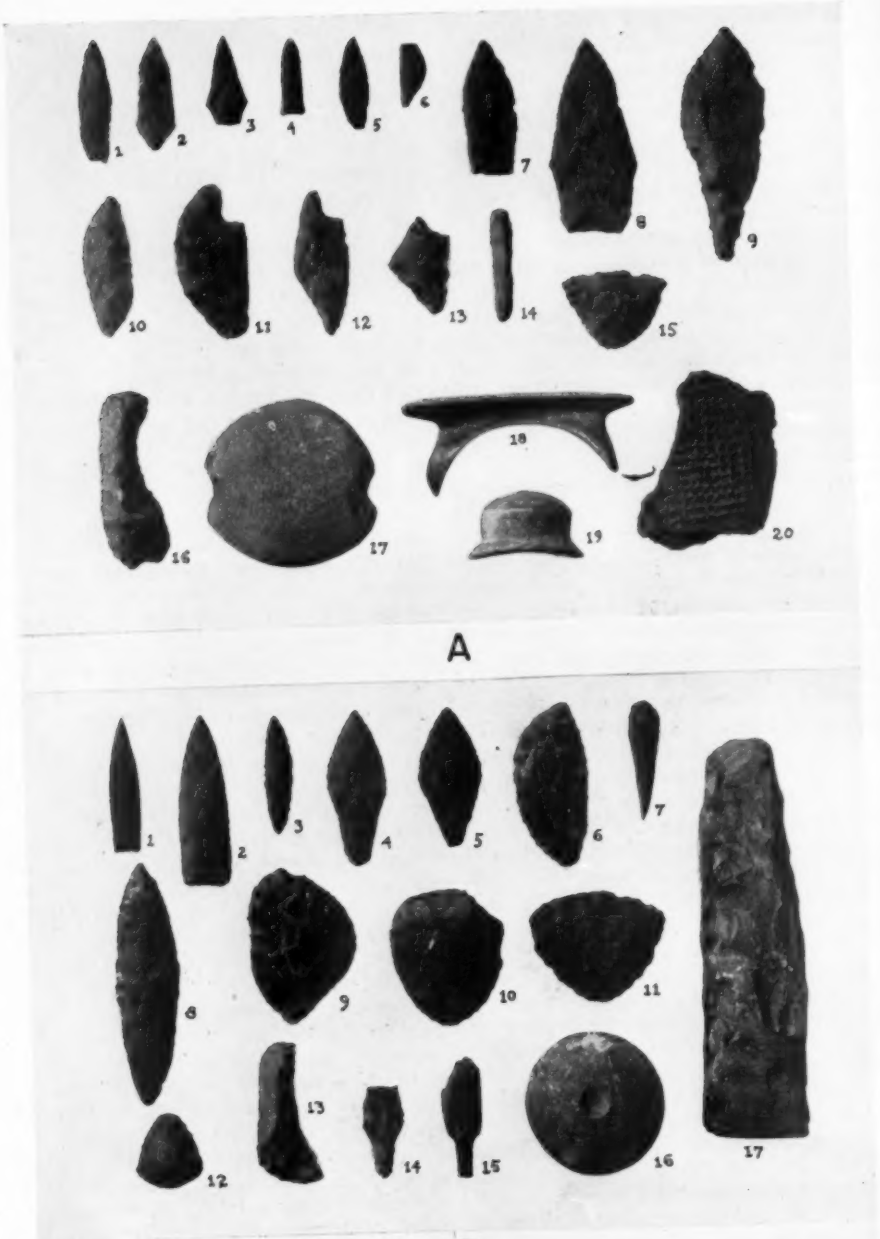


FIG. 56. Artifacts from Chagvan and Nanvak Bays (*A*) and Platinum Village Site (*B*), southwestern Alaska.

is 1.4 cm., the thickest bottom sherd measuring 2.4 cm. The thin, plain sherds also belong to flat-bottomed vessels, but the sides may flare slightly to a wider mouth with a flat or rounded rim. The sherds, only 0.6 cm. thick, are brown all the way through, very hard and fine-grained, and with very few impressions of grass leaves. Similar to these are the sherds with a check-stamped decoration on the outside (Fig. 56, *A*, *20*). They are rather thin, averaging 0.84 cm., hard, and of fine material. They have come from small, flowerpot-shaped vessels with a rounded or outward slanting, straight rim. One bottom is 7 cm. in diameter and the mouth approximately 9 cm., which means that they were probably too small for cooking pots. Most of the sherds are brown or grey all the way through; only a few have a black core. The entire surface is covered with a check-stamped design with each square measuring 0.2–0.3 cm.

Almost all of the 1400 specimens from Chagvan Bay came out of one house, which was not even completely excavated. A floor layer of 7.5 by 6.1 m. was exposed, but the house was probably close to 8 m. square. The size, a huge central fireplace, and the many worked implements found in the house seem to indicate that it had been used as a community house (*qalegi*). The floor layer, consisting of sand and gravel, was thick and hard packed around the fireplace and very thin along the walls, where we assume there had been raised, wooden platforms. We did not find any trace of an entrance passage. It is impossible at this early stage of the study to date this ruin, but because of certain points of similarity with Kachemak Bay II, we may tentatively suggest that it belongs to the later part of this period, or about A.D. 1000.[13]

A few recent box graves, one of which has a Russian cross, are situated on top of one of the ridges. In one of them was found a small, saucer-shaped pottery lamp decorated on the inside with incised concentric circles and a spoked-wheel design in the bottom. This type of lamp, which is characteristic of the Norton Sound-Bristol Bay area, thus seems to be late in this area.[14]

*Nanvak Bay.* A few days were spent at a site in Nanvak Bay, north of Cape Pierce. The site with about 40 ruins is situated on the tip of a small peninsula in the middle of the bay. Most of the houses appear as bowl-shaped depressions, the majority of which are covered by grass and a few by Empetrum. Judging from the vegetation and the preservation of the houses, this site should correspond in age to the Chagvan Bay site, and this was borne out by the excavation. As our time at this place was limited and test pits showed that the houses had a very thin and indistinct floor layer under a thick layer of sand, we excavated a section of the 6 to 8 m. high clay bank which terminates the peninsula. Under a 50 cm. thick sod layer we found 1.5 m. of sand intersected by culture layers of varying thickness and color which contained some artifacts. Most of these were like the finds from the early houses at Chagvan Bay, netsinkers, pumice, chipped stone implements, and check-stamped potsherds. One unusually well made medial labret has the same curved base as Figure 56, *A*, *18*, but the front part is a wide, thin plate, which must have extended like a shelf below the mouth. Below the deepest floor layer near sterile clay was found part of a rather thick-walled, flat-bottomed pot, the surface of which was covered with horizontal impressions probably made with a cord-wrapped paddle. It is yellowish grey in color, very hard, and probably sand tempered. Except for the color and thickness it is reminiscent of the few potsherds found in Ipiutak middens.[15]

*Platinum Village Site.* The present village of Platinum, which is situated not far from the base of the South Spit, consists of an Eskimo village and some larger frame houses most of them belonging to the Goodnews Bay Mining Company.[16] We learned that before the construction of these buildings there were several depressions in the ground at this place, but most of them had been destroyed by bulldozers. We excavated one that was left and found a few chipped flint implements and flint refuse. Later on Mr. and Mrs. Harwood of the Goodnews Bay Mining Company showed us two depressions three-quarters of a mile south of the village, at the base of the spit. One of these depressions, which was covered by Empetrum and grass, proved to contain the remains of a house which had burnt down. Charcoal, ashes, and burnt logs in the fill and on the floor, a great number of unbroken artifacts, and some burnt skeletal remains of two or three small children are the sad evidences of a sudden and violent

[13] De Laguna, 1947, p. 6.

[14] De Laguna 1940, p. 69 and Fig. 8, *2*; 1947, pp. 227–9.

[15] Larsen and Rainey, 1948, Pl. 86, *18*.

[16] We are greatly indebted to the owners and employees of this company for their interest and valuable assistance.

fire. However destructive the fire may have been, it also helped to preserve a good many things which under normal circumstances would have disintegrated. In the first place enough of the wall timber was preserved to give us the dimensions of the house and an idea about its construction. It had an almost square ground plan, 4.4 by 4.2 m., and walls made of heavy, round logs lying horizontally. In places two or three logs were found lying on top of each other forming a vertical wall 30 cm. high and supported by stakes inside the house. Unfortunately, no corners were preserved. The floor, 0.6–1 m. below the surface, consisted of hard packed gravel. A little west of the center of the floor was a 1.4 m. long, 1 m. wide, and 0.4 m. deep depression filled with charcoal and ashes, probably a fire pit. On the three sides of this and parallel with the walls were three heavy logs which may have been platform supports.[17] In several places on the floor and platforms were found pieces of grass matting similar to Figure 57, *3* and *4*, only much coarser.

More than 400 specimens of stone, wood, and grass were found in the house but only a few small fragments of burnt antler objects, and there was no ivory. The find is dominated by chipped stone implements, of which the most important types are shown in Figure 56, *B*. They are made with a finer technique than those from Chagvan Bay and show in technique as well as in form greater resemblance to Ipiutak flint tools than do the latter. Some, like the arrow points (*1*), insert blades (*3*), knife blades (*6*, *8*, *9*), discoidal blades (*10*), semilunar blades (*11*), end scrapers (*12*), sidescrapers (*13*), and drills (*14*), are virtually indistinguishable from the corresponding Ipiutak types. The same applies to the adze blades, of which all three Ipiutak types occur. It was most interesting to find Type 3, the thick form which is characteristic of the Ipiutak culture (Fig. 56, *B*, *17*).[18] Another important Ipiutak trait is the use of side blades in knives. Two hafted knife blades, one with a peculiarly shaped handle, are illustrated in Figure 57, *5* and *6*. Despite many similarities with Ipiutak this find does not belong to the Ipiutak culture proper, for there are two elements foreign to the Ipiutak culture, namely stone lamp and bow drill. Not less than seven lamps and fragments of lamps were found in this house. Except for one irregular lamp and a small hunter's lamp, the typical form is oval with a rounded bottom and a shallow bowl, similar to many lamps found in the Aleutians, Cook Inlet, etc. Especially interesting is the one illustrated in Figure 57, *7*, with a human face incised on the bottom. Like the schematic faces at Ipiutak it is furnished with three short lines on each cheek representing tatoo lines.[19] That bow drills were used is indicated by the presence of drill rests made of disc-shaped concretions (Fig. 56, *B*, 16). Drill bits are either chipped or ground (Fig. 56, *B*, *15*). Of other implement types not known from Ipiutak notched stones (netsinkers) and one ground slate ulo blade may be mentioned. Rather surprisingly, several pieces of basketry were found in this house. Basketry has not been found in any other early Eskimo culture, but that is undoubtedly on account of its perishable nature. It occurs here because the grass has been charred by the fire, and thanks to this accident we have the hitherto missing evidence that basketry is an old element in Eskimo culture. Coiled as well as twined baskets were used. Figure 57, *1* and *2* are pieces of coiled, round baskets, while Figure 57, *3* and *4* are examples of twined basketry.

Having mentioned the most significant types of implements which occur in this house, there is reason to mention one which is absent, viz. pottery. Not a single potsherd was found, and since nothing seemed to have been retrieved after the fire, we can be fairly certain that pottery was not used. The absence of pottery and the close resemblance of the flint industry to that of Ipiutak probably mean that this house represents the earliest culture found in the area. It is related to the Ipiutak culture but is probably later. It has certain traits in common with the Near Ipiutak phase like the chipped points (Fig. 56, *B*, *4*, *5*)[20] and the lamp, but the latter and the netsinkers also point toward connections with the Aleutians and Kachemak Bay culture. At the present stage of the study it is impossible to date this find, but it probably belongs in the first millennium A.D.

*Conclusions.* These investigations demonstrate how little we know about the prehistory of Alaska. When, on a reconnaissance trip like ours, it was possible to find five hitherto unknown stages of Eskimo culture, how much

[17] Larsen and Rainey, 1948, Fig. 6.

[18] Larsen and Rainey, 1948, Pl. 10, *4–6*.

[19] Larsen and Rainey, 1948, Fig. 28.

[20] Larsen and Rainey, 1948, Pl. 80, *1–14*.

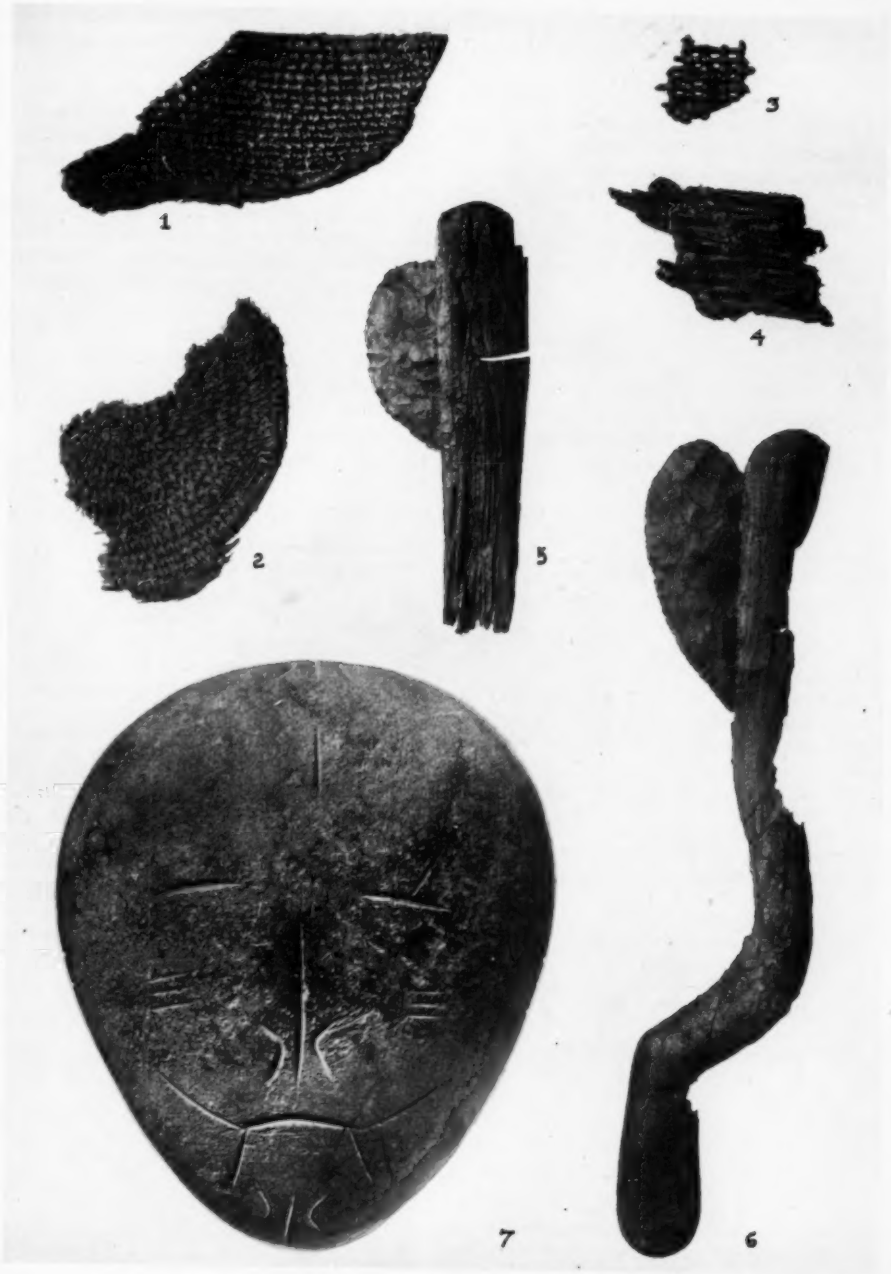


FIG. 57. Artifacts from Platinum Village Site, southwestern Alaska.

more could be found through thorough systematic investigation. Meanwhile, however superficial our investigations might be, we found the Paleo-Eskimo culture we were looking for and thus helped bridge the gap between Ipiutak and Kachemak Bay. From a recent paper we learn that Giddings found two flint horizons in Norton Sound,[21] which leaves little doubt that some day we will find similar cultures in the remaining parts of Alaska. In the Bristol Bay-Kuskokwim Bay area there is a striking difference between later cultures with ground slate implements and rather crude pottery and earlier cultures with chipped stone implements and finer pottery or without pottery. A similar difference was found at Point Hope where the terms Neo-Eskimo or Arctic Whale Hunting culture were applied to the former and Paleo-Eskimo or Ipiutak culture to the latter.[22] Can we use the same terms in southwestern Alaska? We can, if we change the definitions according to the new discoveries. A Paleo-Eskimo culture would thus be a culture in which chipped flint implements are preferably used, and a Neo-Eskimo culture one in which ground slate implements are predominant. In addition to the stone implements pottery can be used as an indicator. Our investigations thus seem to prove that the Neo-Eskimo culture did not stop at Norton Sound, as previously suggested by the writer,[23] but spread as far as the Pacific. Finally we learned the significance of pottery in Eskimo culture. Not only may potsherds be very important time indicators in regions like southwestern Alaska, where conditions of preservation are poor, but they may also prove to be of wider significance. It might not, for instance, be quite accidental that check-stamped and striated pottery are found together in China,[24] Alaska, and southeastern United States.

[21] Giddings, 1949.

[22] Larsen and Rainey, 1948, p. 182.

[23] Larsen and Rainey, 1948, p. 186.

[24] Bylin-Althin, 1946, Pl. 4, *13* and *17*.

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# BIRDSHEAD CAVE, A STRATIFIED SITE IN WIND RIVER BASIN, WYOMING

WESLEY L. BLISS

BIRDSHEAD Cave lies in a fault scarp on the south side of the Owl Creek Mountains about 5 miles west of the entrance to Wind River Canyon, 23 miles north and west of Shoshoni, Wyoming, and 1 mile northwest of the old Burgess ranch buildings. It contained stratified deposits representing seven, perhaps even eight or nine, periods of occupation in six occupation levels covering a wide temporal range. The cave is approached by steep talus slopes broken by limestone rock ledges. It lies about 200 feet above the source of a spring of fresh, potable water emerging near the base of the scarp. The name, Birdshead, is that of an Arapaho Indian who was living at the old Burgess ranch, now part of the Arapaho Indian Reservation.

From the mouth of the cave, facing toward the southwest there is a view of the Wind River Basin covering a radius of 50 miles with the Wind River Range to the west and south, the Beaver Divide and the Granite Mountains to the south, and the Rattle Snake Range to the east and south. Directly north of and above the cave, extending along an east–west axis, lie the Owl Creek Mountains rising between 8,000 and 10,000 feet above sea level and forming the northern boundary of the basin. These ranges enclosing the Wind River Basin condition the climate, reducing the precipitation so that the flora more closely approximates that of the Great Basin areas to the west than that of the Plains to the east, even though the Wind River Basin lies east of the Continental Divide. Within the basin the grass cover is sparse; sage, juniper, and yucca grow on the alluvial fans and talus slopes; cottonwoods occur along the flood plains of the Big Horn River and occasionally along the intermittent stream tributaries. However, immediately to the north of the cave on top of the Owl Creek Mountains the grass is luxuriant with pines, spruce, and firs growing in the sheltered valleys. This area is very favorable for large herbiverous animals, being used by the Arapaho Indians as a summer range for their cattle. Deer, elk, and mountain sheep range the area today which also may have been a feeding ground for bison in the past. Springs occur along the base of the Owl Creek Mountains but disappear into the alluvial fans. With this varied ecological setting coupled with a natural cave shelter the area was well suited for human habitation.

The cave was excavated during the late summer and fall of 1947 as part of the reclamation program of the River Basin Surveys to salvage materials and data from archaeological sites in danger of destruction through the construction of reservoirs in the Missouri Basin. The excavations were made by Jack T. Hughes, J. M. Shippee, H. G. Pierce, and the writer.[1] Birdshead Cave was chosen for excavation from 73 archaeological sites located in the Boysen Reservoir area because: (1) it was the only site which definitely showed stratigraphy from which chronological correlations of other sites might be made and (2) it will lie near the shores of the completed reservoir and was in danger of being destroyed by collectors.

The cultural deposits were excavated in accordance with a grid system of 5-foot squares. The first square was dug by arbitrary levels of 8 inches. Thereafter excavation proceeded by the peeling process, where each of the 10 levels was carefully removed except in the talus and eastern parts of the cave where the levels were absent or poorly defined. In these areas arbitrary levels were again employed. Due to the thin nature of many of the strata, 7 of which were 0.2 of a foot or less in thickness, the excavation had to proceed slowly and with considerable caution. Profiles of the section walls were made every 5 feet. In addition, areal charts were plotted showing the extent of each level and its accompanying features.

The cave, irregular in outline, was approximately 25 feet wide and 30 feet deep. The main areas of occupation were near the mouth, on the left side looking into the cave. That side, because of its higher ceiling, its walls affording more shelter from northerly or westerly winds, its floor covered with more sand and less angular rock fragments, the opening permitting

[1] I wish to express my thanks to Jack T. Hughes and J. M. Shippee, who have closely collaborated with me on the excavations; to Hughes, who collaborated on the field report on Birdshead Cave and should have been classed as co-author of this paper; and also to Dr. T. E. White for identification of the faunal remains.

more sunlight to enter the cave, and its accessibility, was the most favorable part of the cave for habitation. There the occupation levels were well defined and readily distinguished. On the right side of the cave the lower levels tended to pinch out, and profiles blocked by rockfall and disturbed by animals made stratigraphic identification difficult. Near and outside of the mouth of the cave, the levels lost their identity in a talus slope, although two soil zones were observable in the talus.

Ten strata were recognized in the cave, their total maximum thickness being approximately 3.5 feet. A representative section was as follows from top to bottom:

| *Type* | *Average Thickness in Feet* |
|---|---|
| Occupation VI | 0.15 |
| Occupation V | 0.15 |
| Occupation IV—two periods of occupation | 0.2 |
| Culturally sterile | 0.3 |
| Occupation III | 0.1— |
| Culturally sterile | 0.2 |
| Occupation II—two periods of occupation | 0.2 |
| Culturally sterile | 0.9 |
| Occupation I | 0.1 |
| Culturally sterile | 0.3 |

## OCCUPATION LEVELS

### OCCUPATION LEVEL I

*Occurrence and composition.* This stratum of occupation, confined to a small area roughly 5 feet in diameter, was shallow, being only 0.1 of a foot in thickness at the center. Below the occupation stratum was 0.3 of a foot of sterile eolian deposit and angular limestone fragments, some of which had been cemented into a breccia. Above the occupation stratum, between it and the next occupation level, occurred 0.9 of a foot of eolian deposit and limestone fragments containing a few scattered mammal bones but culturally sterile. The occupation level consisted of decomposed organic matter probably of plant origin and a few small flecks of charcoal. Thinness of the deposit and the paucity of artifacts suggest that the site was occupied for a very short period. The organic matter may represent plant growth within the cave at the time of, or shortly before, it was inhabited. The position of the deposit near the mouth of the cave would have been such that plant growth within the cave would have been possible.

*Cultural evidence.* Although charcoal flecks were found there is no evidence of a hearth on this level. A pit hearth from Occupation Level II extended down into the level but was definitely intrusive (see Fig. 58, *bottom*). An accumulation of charcoal was found at one side and slightly above this level. This charcoal was probably deposited by rodent disturbance from the levels above. A burrow was traced in the sediments to within 4 inches of this charcoal deposit. Even though the burrow did not appear to contact the deposit it is probable that it had been obliterated by the collapse of the top of the burrow, depositing sediments which could not be distinguished from the surrounding matrix. If a fire, or fires, had been built as indicated by the charcoal flecks in the deposit, it was probably made near the entrance of the cave on the talus and was subsequently destroyed by the elements.

Artifacts were so scarce as to be practically absent. Among a number of flakes and spalls of gray quartzite only two showed secondary chipping and might be classed as artifacts (Fig. 58, *top*, I). One was a large bifacial blade, ovate in shape. The other was a large unifacial blade, elliptical in shape. Both of these had been shaped by the percussion method. They were of an amorphous type and of little diagnostic value. No points, scrapers, or other artifacts were found which might make it possible to correlate this material with some known complex.

*Faunal remains.* The mammals definitely identified with the occupation level were cottontail (*Sylvilagus* sp.), marmot (*Marmota flaviventris*), cony (*Ochotona* sp.), and white-tailed jack rabbit (*Lepus townsendii*). Questionably identified were chipmunk and an artiodactyl, either deer or antelope. It is possibly significant that the mammals found in this level range at high elevations today. This is particularly true of the cony, whose habitat is in the rock slides in the timberline area between 2,500 and 4,500 feet above the elevation of the cave. Three hypotheses may be formulated relative to the significance and interpretation of the faunal data: (1) If climatic and other ecological factors are responsible for the present distribution of these animals, then it may be assumed that climatic conditions have changed since these mammals were deposited in this level. (2) It is possible that climatic conditions were the same as the present at the time the deposit was laid down and that humans or carniverous animals may have brought these animals down from a higher elevation. (3) It is possible that climatic conditions were the same as the present and

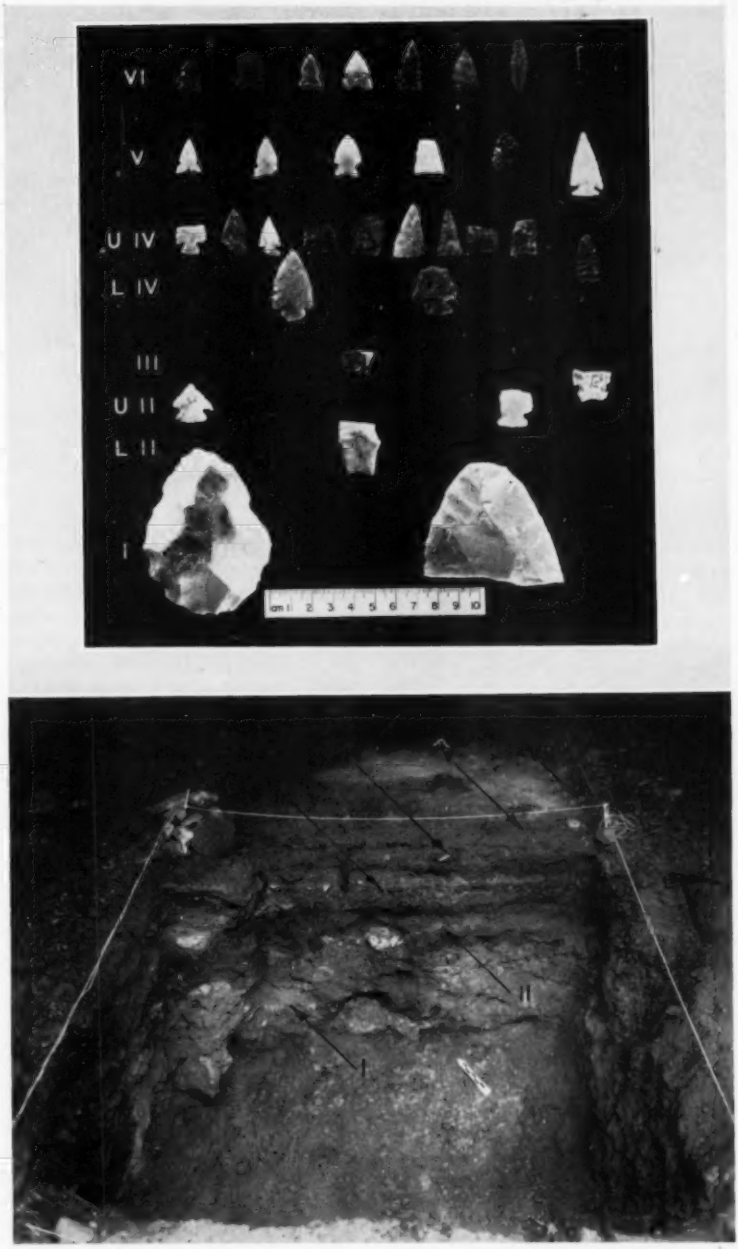


FIG. 58. Birdshead Cave, Wyoming: *Top*, projectile points and two blades arranged in stratigraphic sequence except for the three on the right margin. Points illustrate trends rather than absolute chronological sequence. *Bottom*, stratigraphy along C–D line, Section 2. Pit of hearth from Level II is to the left of center.

that the animals during the time of deposition had a wider ecological range than is found today.

Evidence to support the contention of climatic variation between the period of deposition and the present, including that postulated in the first hypothesis based upon the ecological distribution of the fauna, is meager and warrants reserve in the formulation of conclusions. The almost complete disintegration of the vegetable material from the occupation level, which was at variance with the well-preserved organic materials from the upper occupation levels, is suggestive of more humid conditions during the period of deposition. Additional interpolation of evidence connoting humid conditions is presented in the brecciated limestone occurring immediately below the occupation. The summation of the evidence is insufficient to establish that colder and more humid climatic conditions were present even though the aggregate is suggestive. Cony was positively identified with Occupations I and II and the intermediate culturally sterile level, or with the early deposition in the cave. Marmot was also indigenous to the lower or early levels. Whitetailed jack rabbit occurred in both the upper and lower levels. Cottontail occurred in all levels except the lowest level which was sterile of faunal and cultural remains.

*Temporal considerations.* Reasonable antiquity is indicated for the deposition of Occupation Level I. The sediments above this level contain five occupation levels and three culturally sterile levels. The anemoclastic deposition in the culturally sterile level above Occupation Level I and below Occupation Level II is equal in thickness to the total of the anemoclastic deposition represented in all of the levels above it. Whether or not the same period of time was necessary for the deposition is a factor that could not be determined as the anemoclastic deposits in the upper levels were intercalated with caustophytolithic sediments.

The maximum thickness of sediments underlying Occupation Level I was approximately 0.3 of a foot, indicating that the occupation occurred shortly after the cave had formed to its present proportions. No evidence of extinct faunal species was found but whether they were present or not at the time of deposition is a matter for conjecture as the faunal assemblage was small and not indicative.

Additional evidence of antiquity is presented by the occupation levels overlying Occupation Level I. In the lowest of these, possibly Occupation Level II, a projectile point (Fig. 58, *top*, lower right margin) was found which typologically may be related to the stemmed type from the Signal Butte I-C level.[2]

In summary, the temporal position of Occupational Level I may pre-date the formation at Signal Butte I-C by approximately the same period of time that follows the formation of Signal Butte I-C. However, such dating should be considered as only tentative and based upon interpretative evidence. Whatever the length of time represented in the culturally sterile level, 0.9 of a foot in thickness between Occupation Level I and Occupation Level II, it does represent a considerable lapse of time.

### OCCUPATION LEVEL II

*Occurrence and composition.* The area in which this stratum was clearly defined was confined to the western half of the cave. The stratum was shallow, averaging about 0.2 of a foot in thickness. The occupation level lay between two culturally sterile strata. The deposit contained small angular fragments of limestone mixed with eolian deposits and vegetal material. Some decomposed animal dung was present, and in the northern part of the cave the occupation level blended into a deposit of decomposed animal dung.

*Cultural evidence.* Of the six hearths found associated with this level, three were deep pit hearths, one a surface hearth, one a shallow pit hearth, and one a pit hearth which occurred at the base of the occupation level. The position of this latter hearth indicates an earlier occupation of the level than the other hearths as it was stratigraphically below them, not being exposed until the upper part of the level had been removed. This indicates two periods of occupation for Occupation Level II.

The artifact assemblage was small, none of perishable materials being found although they occurred in some of the occupations above this level. One point (Fig. 58, *top*, L II) was recorded as having come from the base of the level and probably represents the first occupation there. Made from a fine-grained, light-buff quartzite, its base is concave with the heft expanding toward weak shoulders. The tip is missing. There was no evidence of basal grinding.

Two notched points (Fig. 58, *top*, U II) of light chalcedony occurred in the main occupa-

[2] Bliss, MS*a*, MS*b*.

tion on the level. One is complete, while the other is merely a base. A metate fragment, one worked flake, and two unclassifiable fragments complete the assemblage.

This paucity of artifacts considered in relation to the length of time the cave must have been used, as indicated by the six hearths, follows what appears to be a pattern for some of the earlier lithic horizons in the western Plains. Often sites that seem to have been used for some length of time will produce very few artifacts. In the cave this may indicate: (1) a food-gathering economy with hunting of secondary importance, (2) a frugal attitude toward artifacts, or (3) that many of the artifacts, including projectiles, were manufactured from wood or other perishable materials and were not preserved.

*Faunal remains.* Mammals definitely identified from this level are squirrel, cony, jack rabbit, and cottontail. Questionable identifications were made of chipmunk, meadow mouse, a bird, and an artiodactyl, either deer or antelope. The small mammals are predominant, showing that large game may have been but a very minor factor in the food economy.

*Temporal considerations.* In the talus slope a soil zone occurred which was traced in the profiles to the base of Occupation Level II. This soil on the well-drained talus slope probably represents a true soil formed by climatic conditions. It is not a local soil conditioned by local factors of erosion and deposition. This soil may correlate with the soil formation in "Signal Butte I." A later soil was found near the surface of the talus which may correspond to the soil in Signal Butte III. However, more research is needed upon the range of soils and the past climatic conditions that fostered them as well as archaeological research to show that certain true soils, widely separated, represent the same time period.

The writer[3] has questioned the existence of a true soil in Signal Butte II. If there is a correlation between the soils of Birdshead Cave and Signal Butte, the sites may be cross dated.[4] That there may be some correlation is evidenced by the base of a point (Fig. 58, *top*, point in lower right margin) which was removed from Test A in the cave at a depth of 16–24 inches. This point base could not be definitely associated with the occupation levels as it was removed from an arbitrary level in a test before the individual cultural levels had been recognized. However, its position indicates that it followed the soil-forming period in the talus. It is similar to the stemmed points found in the upper stratum, I-C in "Signal Butte I."[5]

The age given to the soil may vary depending upon the date accepted for the soil-forming period: Sears' estimate of approximately 5,000 years ago, which Strong[6] gave to Signal Butte II, or Antevs'[7] more conservative estimate of approximately 3,000 years ago. Charcoal, in sufficient quantities for dendrochronological dating, occurred in all occupation levels except Occupation I. This charcoal is being studied by Harry E. Weakly but the results are not ready for publication. They may give a check on the probable antiquity of the occupation and of the soil in the talus slope correlating with its base.

The decomposed nature of a dung deposit in the rear of the cave into which this occupation level fused may be indicative of a more humid climate than is present in the area today and may correspond to the soil-forming period represented by the soil in the talus.

### OCCUPATION LEVEL III

*Occurrence and composition.* This level was well defined in the western part of the cave. Sterile layers containing small, angular, limestone fragments mixed with eolian and vegetal remains (possibly decomposed animal dung) separated this occupation from Occupation II below and Occupation VI above. Near the west wall of the cave, in sections C and D, the sterile level below lensed out, causing Occupation Level III to rest directly on Occupation Level II. Level III was thin, indicating a short period of occupation.

*Cultural evidence.* Two pit hearths were identified with this occupation. Another pit hearth was questionably identified with it or occurred at its base. The stratigraphy was not sufficiently well defined to clarify the position of this hearth. No surface hearths were associated with this period of occupation.

Artifacts were few. The base of a point (Fig. 58, *top*, III) from the level appears to be of a

[3] Bliss, MS*a*.

[4] *Bliss.*, MS*b*.

[5] *Ibid.*

[6] Strong, 1935, p. 239.

[7] Antevs, paper at Sixth Plains Archaeological Conference (MS).

type similar to that found in the lower part of Occupation II. It has a convex base with heft slightly flaring toward weak shoulders. However, its fragmentary nature makes positive type identification impossible. One straight-based knife, one unclassifiable knife, one projectile point or knife fragment, three worked flakes, one oval mano, one unclassifiable mano, two bone awls, and two small wooden stakes complete the artifact list.

*Faunal remains.* Jack rabbit, cottontail, and grouse occurred in the level. Very few bones were found, which adds weight to the implication that this occupation was of very short duration.

*Temporal considerations.* The charcoal from the hearths should aid in the dating of this level when the specimens have been studied. On its western limits this occupation rests directly on Occupation II although they are separated by a sterile layer to the north and east. The length of time represented by the intermediate sterile layer cannot be postulated with any degree of accuracy. The results of the tree-ring studies on the charcoal, when available, should indicate the time gap between Occupation II and Occupation III.

### OCCUPATION LEVEL IV

*Occurrence and composition.* This occupation level was separated from the lower Occupation Level III by a culturally sterile stratum composed of small angular fragments of limestone intercalated with some eolian and vegetal deposition. Occupation Level V, above, lay directly upon it. This juxtaposition may account for some mixture of cultural materials between the periods of occupation.

Dung pellets, fibers, and wood were well preserved in a matrix of small angular limestone fragments and eolian deposit. This occupation level was divided into two periods of occupation. The physical nature of the sediments and the cultural remains indicated two periods of occupation.

*Cultural evidence.* The lower occupation was characterized by pit fire hearths and corner-notched projectile points. Two large corner-notched points (Fig. 58, *top*, L IV) were found on the level of this lower occupation along with one small corner-notched point (Fig. 58, *top*, right margin center). Another corner-notched point (Fig. 58, *top*, upper right margin) probably belongs to this level but was found with a pit fire hearth whose exact stratigraphical position could not be determined. It will be necessary to await the dendrochronological studies of the charcoal from this feature before it can be correlated with a definite level.

The upper part of Occupation Level IV produced shallow pit hearths. Of the nine projectile points recovered, six were small triangular points, one was a small corner-notched point, one a small base- and side-notched point, and one a small side-notched point. The basic point type appears to have been the small triangular point. Whether or not the other three points belong to this period of occupation or are intrusive from occupations above or below could not be determined.

That pottery-making was known is indicated by a small, flat, oval, incised, decorated, baked clay object that may have been used in the hand game. No pottery vessels or sherds were found. Other artifacts from Occupation Level IV are: three flat-based knives; two unshaped-base knives; one unclassified knife; one small flat-based blade; two irregular, large, bifacial blades; one side scraper; two unclassified scrapers; one unclassified drill; two gravers; nine worked flakes; one long and one short tubular, bone bead; one bone awl; one wooden stake; one double strand juniper bark cord; one double strand unidentified cord; and four fragments of rabbit hair cloth.

*Faunal remains.* Jack rabbit, cottontail, bighorn sheep (*Ovis canadensis*), deer (*Odocoileus* sp.), and bird bones are positively identified from this level. Questionably identified are: chipmunk, cony, coyote, antelope, and bison. It is in this level that the large herbivorous mammals begin to be prominent.

*Temporal considerations.* The upper occupation in this level is post-lithic, falling within the ceramic period. The lower occupation appears to have been a lithic horizon although there is the possibility that pottery-making was known but none chanced to be deposited in the cave. However, this occupation level is noteworthy as it appears to be the transitional stage between the lithic horizons with deep pit fire hearths, with small game being used for food, and with large projectile points; and the ceramic horizons with shallow or surface fire hearths, with large herbivorous animals used along with the smaller animals in the diet, and with small projectile (probably arrow) points.

Dendrochronological dating of the charcoal

should produce evidence on the time when this transition occurred.

### OCCUPATION LEVEL V

*Occurrence and composition.* This occupation level was characterized as a compact dung layer which covered the greater part of the cave, being absent only in the sheltered niches and in an irregular area near the mouth of the cave at the southern extremity of the deposits. It lay directly on Occupation Level IV and directly beneath Occupation Level VI with no intervening sterile deposits. An analysis of the dung and hair from this level has not yet been made so it is not possible to say what animals were present to deposit and tramp the material into a compact layer.

*Cultural evidence.* The five hearths from this level were either shallow pit or surface hearths. Additional features included four small pits, one containing charcoal but no evidence of a fire having been built in it.

The list of artifacts from this level is large compared to the material from other levels. The projectile points include three small, side- and base-notched points and two small, triangular points. This appears to be a transition between small, triangular points which predominate in the Occupation Level IV below and the small, side- and base-notched points which predominate in Occupation Level VI above. However, instead of a transition there may have been a sharp break between these types but the thin nature of the strata makes any definite temporal distinction a matter for conjecture. No such difference could be demonstrated by their distributions in the deposits.

Potsherds occurred in this level. These have been divided by Jack Hughes[8] into two types classed as A and B, which may represent two different vessels.

Class A has a liberal quantity of coarse sand tempering; an exterior surface of various shades of dark brown to black indicating uneven firing; crisp porous texture; and hardness of about 3. A film of greasy soot covered the interior, suggesting use as a cooking vessel. Four sherds of this class were found in the level. Class B is characterized by less gritty texture and finer clay than in Class A; it was sand tempered; walls of rim were straight near the lip; lip bulged toward the interior of the vessel and was flat on top; color was dark brown to dark gray, suggesting vessel was fired under reducing conditions; hardness was about 3; and traces of sooty deposit suggest a cooking vessel. Neither Class A or B was decorated. Only one sherd of Class B was found in Occupation Level V.

Other artifacts from Occupation Level V include five flattened-base knives, one unshaped-base knife, one rounded-base knife, one small flat-base knife, two small round-base knives, one end scraper, six unclassified scrapers, one unclassified drill, three gravers, eighteen worked flakes, one metate fragment, one hammerstone, three steatite vessel fragments, one long tubular bone bead, one bone shaft wrench, five wood shaft fragments, four stakes, four single strand juniper bark cords, two unidentified single strand cords, two unidentified double strand cords, three yucca leaf strips, and one small rusted fragment of iron.

*Faunal remains.* Jack rabbit, cottontail, antelope (*Antilocapra americana*), bighorn sheep, deer, and bird are definitely identified with this occupation level. Questionably identified are coyote, bison, and cony. Again, as with the Level IV occupation below, the large, herbivorous mammals were found along with the small game animals.

*Temporal considerations.* The small fragment of iron recovered suggests that this occupation may fall within the historic period. However, as the top level above was composed of a thin, loose, unconsolidated matrix it is possible that the iron fragment may have worked down to this level. Charcoal from the fire hearths should give a dating for this level when the dendrochronological studies have been completed.

The steatite fragments suggest that the culture had contact with, or may have come from, the west and might possibly have been associated with some Shoshonean group. The projectile points and shaft fragments suggest the use of the bow and arrow. The pottery and the projectile points indicate a probable mixture between this level and the top level in the cave just above it. This was anticipated, as the compact dung of Occupation Level V was the base for the loose unconsolidated matrix of the level above, Occupation Level VI.

### OCCUPATION LEVEL VI

*Occurrence and composition.* This level was a thin, loose mixture of angular limestone fragments, sticks, dung pellets, dust, and debris.

[8] Bliss and Hughes, MS.

It lay directly over the compact dung of Occupation Level V. Pack rat nests were found around the rock fall in the center of the cave and in two of the niches along the cave wall. Along the eastern side of the cave this level was represented by a thin layer of angular limestone fragments resting on a bed rock shelf.

*Cultural evidence.* No fire hearths were associated directly with this level. There were fire hearths below it on the surface of the compact dung. The only feature was an accumulation of juniper bast spread out near the back of the cave. This may have been used as a base for a bed.

The nature of the deposits with the lack of fire hearths and the large number of artifacts recovered suggests that these may be associated with a period corresponding to the end of Occupation Level V.

Seven projectile points are definitely identified from this level. These include four small, side- and base-notched points, one small corner-notched point, one incomplete point, and one pointed-base point or drill (Fig. 58, *top*, VI). One of these points still retained the sinew shaft binding. The side- and base-notched points definitely predominate in this level.

Other artifacts include four flat-base knives, one round-base knife, one flat-base flake knife, one round-base flake knife, two small flat-base blades, one small round-base blade, one large sub-rectangular bifacial blade, one large irregular bifacial blade, one concave scraper, two straight drills, four gravers, twenty-five worked flakes, one oval mano, one sub-rectangular mano, one unclassified mano, one abrader, one anvil slab, one steatite vessel fragment, three bone awls, three wooden shaft fragments, seven sherds of Class A pottery, one pottery paste fragment, thirty-three single strand juniper bark cords, and five unidentified single strand cords.

*Faunal remains.* Pocket gopher (*Thomomys* sp.), pack rat (*Neotoma* sp.), jack rabbit, cottontail, antelope, bighorn sheep, deer, and bird are positively identified with this level. Questionably identified are bison, duck, fox, and cony. Again, as with the two previous occupation levels, large herbivorous mammals were found.

*Temporal considerations.* This level is the most recent in the cave. The age of the artifacts may vary from very recent to whatever date may be found for the charcoal in the fire hearths on the surface of Occupation Level V. The accumulation is continuing today, as the walls of the cave were noted to be sluffing and fresh juniper fronds are being carried in by rodents.

## RECAPITULATION AND SUMMARY

Correlations and interpretations cannot be made until all of the data are complete on the Birdshead Cave deposits. The dendrochronological study of the charcoal by Mr. Weakly should provide an important part of these data. Also, the fiber, dung, hair, feathers, and plant specimens are yet to be identified. The results of these identifications should give information on the animals that lived in the cave, types of plants used by the cave inhabitants, and possible climatic variations between levels. An analysis of a sulphurous stalactitic drip and its rate of deposition might be an alternate method of dating the large rock fall in the center of the cave.

However, the analysis of the data at hand indicates that the deposits in Birdshead Cave, even though shallow, have considerable antiquity.

The first occupation, Occupation Level I, cannot be correlated with any known lithic horizons due to the paucity of key artifacts. That this level was deposited under different climatic conditions than those that prevail in the area today is suggested by the faunal assemblage of mammals known to range at higher elevations; by the absence of perishable materials; and by the brecciated nature of the limestone fragments found in the level below. Also a thin soil zone is suggested in this level. However, until more is known of the vegetal material a cooler, moister climate can only be postulated and it should be recognized that the evidence is rather weak.

Occupation Level II may correlate with the end of the soil-forming period corresponding to that which Sears[9] placed at about 5,000 years ago, the soil-forming period (Prairie Sub-humid of Iowa) which was employed in dating Signal Butte II but which the writer[10] believes may correspond to "Signal Butte I." Or it may be considered as about 3,000 years ago on the basis of Antevs'[11] dating for the end of the soil-forming period.

Occupation Level II probably represents two

[9] Strong, 1935, pp. 237–9.
[10] Bliss, MSa.
[11] Antevs, MS.

periods of occupation, the lower containing a concave-base, flared heft, weak-shouldered type of point, and the upper containing corner-notched points. Hunting of small mammals is suggested by the animal bones recovered. The deep pit fire hearths suggest roasting pits for tubers. The economy appears to have been largely dependent upon plant foods supplemented by small game.

Occupation Level III, from the thin nature of the deposits, probably represents a short period of occupation. The presence of deep pit hearths, the paucity of recovered artifacts, and the presence of small animal bones suggest an economy and culture similar to that of Occupation Level II.

Occupation Level IV represents two periods of occupation. The first was characterized by deep (roasting) pit type of hearth and large corner-notched projectile points. The last occupation used shallow or surface hearths and the majority of the projectile points were of the small, triangular type. The pottery object possibly used in a hand game was associated with a feature in this upper occupation and shows that the making of pottery was known even though no vessel sherds were found.

The occurrence of rabbit hair cloth suggests a group with cultural affinities with the Great Basin rather than the Plains. This affiliation is also indicated by the use of plant fibers, rather than animal fibers, for cordage. Juniper bast for bed foundations also suggests a Great Basin rather than a Plains trait.

In this occupation level along with the change in projectile point types from large points to small and the change in fire hearths from the deep pits to shallow pit or surface hearths there is a change in the economy. Large mammals become prominent. Thus, hunting appears to have predominated over food-gathering. This is suggestive of a more efficient method of hunting and may indicate that the bow and arrow were replacing the atlatl.

Occupation Level V is characterized by small projectile points with the small triangular, and the small side- and base-notched types present. This occupation level may represent two periods of occupation but the evidence is not conclusive. Pottery vessels, in the form of sherds, were known during this period as were steatite vessels. The hearths are shallow or surface hearths. Large herbivorous animals were used in the diet.

The small rusted fragment of iron found in this level, as suggested, may be intrusive; however, the dating of the charcoal from the hearths should establish its true provenience.

The steatite suggests a western affiliation, possibly Shoshonean, for this period of occupation. Steatite was noted in collections near, and in, the Rocky Mountain area but was not observed in collections on the Plains proper.

Occupation Level VI shows a close correlation with Occupation Level V and because of the loose nature of the deposit there is undoubtedly some mixture between the levels. The use of the bow and arrow is known from arrow feathers, pieces of arrow shafts, and an arrow point found with the binding intact. Large mammals were prominent in the diet. Potsherds and fragments of a steatite vessel occurred in this level. The occurrence of steatite and plant fiber cordage suggest a western rather than eastern affiliation.

A complete analysis and inter-correlation of the artifacts including ceramic and lithic types have not yet been completed. When all of the data are present and have been evaluated, the deposits of Birdshead Cave should produce important evidence, covering a rather long temporal period, on the cultural history of the Wind River Basin of central Wyoming. Additional information can be obtained by the excavation of some of the 72 other archaeological sites recorded in the Boysen Reservoir area.

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# AN ANDEAN CERAMIC TRADITION IN HISTORICAL PERSPECTIVE

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THE potter's art of pre-Columbian Peru has long received high acclaim, and the antiquity and technical perfection of the several Andean ceramic styles is generally acknowledged. Scarcely a year passes but what new pottery types are recognized by archaeologists, and the descriptions of these fill many volumes. It is altogether incredible, therefore, that for the entire 400-year period that has elapsed since the coming of the Spaniards, there exists no detailed and systematic account of the techniques of pottery manufacture employed by any group in the Andean area.[1] With reference to the Conquest period, Rowe states that "the chroniclers say little about Inca pottery," while Linné, who combed the literature for data concerning Andean ceramic technology, concluded that " . . . from the time of the discovery of Peru no descriptions exist as to pottery-making."[2] Although no one would seriously deny that the "Golden Age" of Andean ceramics is long since past, highland Indians in several regions of Ecuador, Peru, and Bolivia continue to make pottery vessels and, by and large, to employ aboriginal techniques in their manufacture.[3] This being the case, the writer believes that an account of the pottery-making techniques of a contemporary Andean Indian group —the Aymara—may serve to shed some light on the question of ceramic technology in this area during pre-Columbian times.

An additional objective of the present paper will be to examine the utility of Willey's recently formulated concept of "pottery tradition" as applied to a particular ceramic tradition—that of the Aymara. In his words, "a pottery tradition comprises a line, or a number of lines, of pottery development through time within the confines of a certain technique or decorative constant."[4] Willey suggests, and the writer wholeheartedly agrees, that the study of pottery traditions may be expected to explain more fully the cultural processes that have been operative in the persistence of some pottery styles throughout the several centuries of Andean culture development. In the case of the Aymara ceramic tradition, conditions are especially favorable for such an inquiry. Here the generalized data furnished by archaeology may be checked against and supplemented by the specific data of history and ethnology. The composite picture that emerges from such a synthesis reveals a remarkable ceramic continuity in the northwest Titicaca Basin area, and demonstrates the persistence of the Aymara pottery tradition over a span of five centuries.

It will be the method of the present paper, then, to bring the data afforded by archaeology, traditional and recorded history, and ethnology to bear upon the development of the Aymara ceramic tradition viewed through time and against the broader background of culture change. In such an approach, it will be necessary to examine this tradition as manifested

* This paper has had the benefit of helpful suggestions and criticism by Drs. William Duncan Strong, Gordon R. Willey, and John H. Rowe.

[1] Some information regarding the technology of ancient Andean ceramics has, however, been obtained through the observation and analysis of specimens in museums. See D'Harcourt, 1924; Linné, 1925; Tello, 1938; Bennett and Bird, 1949, pp. 245–50; Larco Hoyle, 1948.

[2] Rowe, 1946, p. 243; Linné, 1925, p. 81.

[3] The most systematic, though exceedingly brief, description appears to be that by Parsons (1945, pp. 24–5) for the Otavalo Indians of Ecuador.

[4] Willey, 1945, p. 53.

at several stages of its history: (1) during the period of the Inca domination of the Titicaca Basin; (2) during the era of Spanish rule; (3) as it exists at the present time. In concluding, an attempt will be made to set forth some patterns that seem to have implications for Andean prehistory as a whole.

The data that pertain to contemporary Aymara pottery-making were collected during 1940–42 in the village of Chucuito, Department of Puno, in the southern Peruvian highlands.[5] This community, situated on the northwestern shore of Lake Titicaca at an altitude of some 13,000 feet above sea level, was the seat of an important local dynasty during late Inca times, and is located in what was anciently, and continues to be today, the heart of a ceramic-producing area. To the southeast, across the lake, the ruins of Tiahuanaco—the type site of this well known Bolivian ceramic style—stand not far from the modern Aymara pottery-making centers of Achacache and Ancoraymes. To the north, the pottery-making town of Pucará almost covers the ancient ruins known by the same name, while the ceramic center of Santiago de Pupuja is situated not far distant.[6] Although at the present time the village of Chucuito proper does not specialize in the production of ceramics, the inhabitants of three of the outlying *ayllus* that pertain to Chucuito manufacture pottery on a considerable scale, and trade their products for the specialties of other *ayllus* and communities. It is unfortunate that adequate comparative data relating to pottery manufacture by other Aymara groups are not available; it seems not unlikely, however, that the Chucuito material is at least representative of the Peruvian Aymara of the present day.

## THE INCA ERA

Although ceramic remains pertaining to the early and middle horizons are encountered sporadically in and around Chucuito, archaeological evidence points conclusively to the town's having been founded during the late period.[7] Indeed, native tradition had it that most of the important Aymara towns of the western Titicaca lakeshore were founded—by the ruler of Chucuito, Cari—as late as the reign of Inca Viracocha.[8] During the period immediately prior to the Inca conquest of the Titicaca Basin the Aymara were organized in a number of small, independent "states" or sub-tribes, each of which appears to have been somewhat distinctive with respect to culture and to dialect.[9] In the western and northern portion of Aymara territory, the most important of these were the Colla, with their capital at Hatuncolla and the Lupaca, whose principal town was Chucuito. Preliminary archaeological reconnaissance has revealed that at this time a variety of types of pottery were manufactured locally, and it seems possible to link at least some of these with the several Aymara subtribes.[10] Thus it is clear, for example, that the greatest concentration of the so-called Chucuito types (Polychrome and Black on Red) is encountered within the traditional territorial limits of the Lupaca, and countless sherds are to be found in and around Chucuito village itself.

These Chucuito types, which have been described and illustrated elsewhere, may be summarized as follows:[11]

*Chucuito Polychrome:* Paste fine textured, ranging from pink or light red to (on the surface) orange or buff; fine grit temper, often with mica inclusions; surfaces carefully smoothed, with marks of smoothing tool evident; sometimes washed or slipped in the same color as the paste; designs painted in glossy or mat black, hematite red, occasionally white, and occasionally a purplish red. Designs are both linear and naturalistic, including animals, birds, fish (suchi, or "catfish"), human figures, flowers, and plants. Shapes—although the total range is but poorly known at the present time—are for the most part simple hemispherical bowls (often with "dimpled" bottom), but large chicha jars also occur.[12]

*Chucuito Black on Red:* This type is essentially the same as the preceding, save that it lacks decoration in colors other than glossy black. The range both in designs and

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[5] The field studies in Chucuito were financed by generous grants by the Peabody Museum and the Division of Anthropology of Harvard University.

[6] In pre-Conquest times the inhabitants of Pucará and Santiago de Pupuja were Aymara-speaking Indians; today, however, these towns lie within Quechua territory.

[7] See M. H. Tschopik, 1946, Table IV, p. 22.

[8] Rowe, n.d. If Rowe's dating is correct, these towns were probably founded early in the fifteenth century (Rowe, 1945, p. 277).

[9] H. Tschopik, Jr., 1946, pp. 503–4.

[10] M. H. Tschopik, 1946, pp. 51–2.

[11] *Ibid.*, pp. 27–31. Both figurines and pottery spindle whorls have been recovered archaeologically in Chucuito; it is not possible, however, to date these with any degree of accuracy.

[12] "Chicha" is a general term employed to designate the native fermented beverages of the Andean region.

shapes is virtually the same as for Chucuito Polychrome. In addition to these types and to other decorated pieces which are presumed to have been obtained by trade with neighboring Aymara groups, sherds of undecorated cooking pots, bowls, and basins—in all likelihood of local manufacture—occur in Chucuito in abundance.[13]

Although cultural influences from the Cuzco region undoubtedly began to penetrate the northwestern Titicaca Basin at least as early as the reign of Viracocha, Lupaca territory was not actually subjugated by the Inca until the reign of Pachacuti Inca Yupanqui.[14] On the basis of dates given by Cabello Balboa, Rowe calculates the Inca conquest of Chucuito to have taken place about 1445, or less than a century before the arrival of the Spaniards in that town.[15] It was not until the reign of Topa Inca Yupanqui, some years later, however, that the last important Lupaca insurrection was crushed and peace finally established in Chucuito. At this time Inca garrisons were stationed in Lupaca territory (and elsewhere), colonists or *mitimaes* from other regions were brought in, and Inca governors and delegates were installed in the important towns.[16] In spite of these precautionary and administrative measures, however, the local Chucuito dynasty was allowed to remain; when Cieza de León arrived in Chucuito early in the sixteenth century, it was a local Aymara chieftain, Cariapasa, who welcomed him.[17]

The exact nature of the impact of Inca culture on that of the Aymara is not known in great detail. Although the period of their domination of the Titicaca Basin was brief, the Inca erected numerous and large religious structures in Aymara territory, particularly on the islands of the Sun and the Moon, but also in other areas.[18] Chucuito became an especially important administrative center, the chief city of that portion of the Empire known as Collasuyu. New trends in religion and new temple cults—especially those of the Sun and Viracocha—were introduced, and the new Inca aristocracy increased social and political complexity. The manufactures and products of other regions, including the seacoast and the east Andean jungle country, were available in greater quantity than before. Generally speaking, Aymara culture was enriched under Inca rule, but it was neither exterminated nor profoundly altered. It would, perhaps, not be improper to state that Inca culture and Aymara culture coexisted for a brief interval in time, but that they appear to have remained in large part distinct.[19] In spite of such acculturation as did take place at this time, Cuzco Quechua and Aymara culture remained essentially distinguishable, and such is the case at the present time.

However slight may have been the influence of Inca culture on that of the Aymara, native ceramics of the Titicaca Basin reflect this era scarcely at all. As Rowe has observed, "The vitality of the local (Aymara) styles is impressive; an occasional piece with local designs on a Cuzco shape or an odd Inca piece in a local grave lot is about all the ceramic evidence for the Inca occupation."[20] In a similar vein, Bennett writes of the late period of the Titicaca Basin: " . . . *Inca* is found as a pure style unmixed with anything demonstrably local."[21]

The above statements describe quite accurately the archaeological picture in Chucuito itself; while several Inca types are found in abundance both on the surface and in excavation, they exist alongside the local Chucuito types which continued to be manufactured, and in quantity, after the Inca conquest.[22] The question of whether most of the Inca pieces were produced locally or whether they were in large part imported from the outside can only be decided by further excavation. By and large, however, the two ceramic traditions are highly standardized and stylistically distinct; the Inca types are almost invariably recognizable as

[13] It is possible that Taraco Polychrome and Sillustani Black and White on Red, both of which occur in Chucuito, although not in quantity, may be attributed to the Colla sub-tribe to the north. See M. H. Tschopik, 1946, pp. 27, 51.

[14] Rowe, 1945, p. 270.

[15] *Ibid.*, p. 278.

[16] Cieza de León, 1883. Chap. LV. The presence today of an "Inca *ayllu*" in several communities of the northwestern Titicaca lakeshore probably reflects the Inca occupation.

[17] "Cariapasa fue señor deste pueblo (Chucuito) . . . " (Cieza de León, 1922, Chap. CIV).

[18] Cf. Bandelier, 1910.

[19] Strictly speaking, the two cultures did not exist side by side; rather, the Inca comprised an aristocratic class in Aymara territory.

[20] Rowe, 1945, p. 278.

[21] Bennett, 1946, p. 142.

[22] For descriptions of Inca types—particularly Cuzco Polychromes A and B—found at Chucuito, see M. H. Tschopik, 1946, pp. 36–41. For an account of the classical Cuzco Inca styles, see Rowe, 1944, pp. 43–50. Typical Inca shapes are illustrated in this same report (Fig. 8, p. 48). Also see Bingham, 1915, pp. 257–71.

such, and while there are a few isolated examples of Inca-influenced Chucuito pottery, such pieces are most unusual.[23]

The local unpainted utilitarian vessels continued to be produced as before, and it is impossible except through stratigraphy or by grave association to isolate those of the Inca period of occupation from those that preceded it.[24] It should be noted in this connection that neither in the case of Inca nor of local Aymara ceramics is it possible to draw a hard and fast line on stylistic grounds between "utilitarian" ware on the one hand and "ceremonial" ware on the other. This is to say that the distinction between decorated and non-decorated ware does not necessarily imply a corresponding difference in usage.[25]

To sum up the foregoing, for roughly a century before the arrival of the Spaniards the Aymara were dominated by the Inca and were incorporated into the Empire. Although the extent of the cultural give and take that took place at this time is not known in detail, native Aymara ceramics of Inca date exhibit scarcely a trace of Inca influence.

## THE SPANISH COLONIAL ERA

Although, as Kubler has observed, no aspect of Colonial life has been so poorly studied as its material culture,[26] a combination of documentary historical and archaeological evidence does throw not inconsiderable light on the development of Aymara ceramics during the Spanish Colonial era. The exigencies of space obviously preclude any thorough-going discussion of so intricate and complex a subject as that of the impact of Spanish culture on the Aymara; it is, nevertheless, essential to an understanding of ceramic changes during the three centuries of Spanish rule that certain aspects of Colonial Peruvian life be considered briefly.[27]

The first Spaniards to explore the Titicaca Basin were Diego de Agüero and Pedro Martínez de Moguer, who arrived in 1533. After a brief reconnaissance, they returned to Cuzco to report that the region was densely populated and rich in gold. Military conquest, of course, followed swiftly and in the wake of Spanish soldiers, miners and missionaries hastened to over-run Aymara territory. The first of the latter to visit Chucuito was Fray Tomás de San Martín, who arrived about 1540, and by the mid-sixteenth century, Dominican Friars had established a monastery in the town. Next came the Jesuit church-builders and the Spanish *encomenderos*, and with them the systematic exploitation of the Aymara by church and state alike.[28] Important silver mines were discovered in the Puno region, and the great wealth of the area under the Viceroyalty is reflected by the marvelous churches that were erected in every Aymara town of any size. During the sixteenth and early seventeenth centuries, Chucuito was the most important Colonial city on the northwest shore of Lake Titicaca, although later it was eclipsed by Juli, and still later by Puno. Because of the altitude and the cold, however, the Spanish population of the *altiplano* was probably never great proportionately, and most Spanish residents, although they maintained houses in the Titicaca towns, preferred to live in the more pleasant environs of Arequipa.[29]

From the first the Spaniards replaced the Inca as the ruling caste; as conquerors reared in a feudal society, they set themselves above and apart from the native peasantry. Under the Viceroyalty the Indians were virtually slaves, and served their Spanish masters in many ways, but chiefly as food producers, payers of tribute, forced laborers in the mines, and as household servants. It would be absurd to attempt to minimize the profound cultural

[23] For illustrations of Inca-influenced Chucuito types, see M. H. Tschopik, 1946, Figs. 15, *a*, *d*; 16, *f*.

[24] Utilitarian pieces known to date from the period of Inca occupation are illustrated by Marion Tschopik (*Ibid.*, Fig. 29, p. 43). Other typical Aymara shapes (chicha jars, cooking pots, and possibly, jugs) are illustrated in Rydén (1947, Fig. 133, *B*, *D*, *F*, p. 292; Table 2: "small rimmed vessels"). Rydén identifies the inhabitants of this late Inca site, Pucará de Khonkho, as Colla (Aymara) Indians, as yet uninfluenced by Inca culture (*Ibid.*, p. 326).

[25] Dr. James A. Ford informs me that during the late pressed ware periods on the North Coast, after the disappearance of Mochica, a large proportion of the same types of ceramics are found both as grave furniture and in refuse deposits. The sharp differentiation between ceremonial burial ware and the strictly utilitarian kitchen ware that characterized the earlier periods appears to have broken down somewhat.

[26] Kubler, 1946, p. 363.

[27] For a short account of the Spanish Colonial history of the Puno region, see Romero, 1928, pp. 12–57.

[28] In actual fact, at the time of the census of 1583, the Province of Chucuito was the only considerable part of Aymara territory not granted in *encomienda;* it was then administered direct for the crown, first by a *corregidor*, and then by a *gobernador* (Levillier, 1921–26, Vol. 9, pp. 114–230).

[29] Romero, 1928, p. 30.

changes wrought during the Colonial era.[30] In some measure, changes were effected in every aspect of Aymara life.[31] Yet, for reasons set out below modifications in the field of material culture—particularly in the realm of manufactures—came about gradually, and with no abrupt transition.

First, it is important to remember that—with the exception of firearms, steel, and, perhaps, of certain mechanical skills—the material culture of sixteenth century Spain was not vastly superior to that of the Andean Indians of the same period. Although newly introduced species of domesticated animals and cultivated plants were accepted swiftly by the latter because of their obvious utility, this was not always the case with manufactures. The Spaniards themselves, for example, had nothing but enthusiasm for the excellent native-woven textiles, the best of which rivaled the most elegant Spanish fabrics in the appreciation of the Creoles.[32] Similarly, aboriginal techniques of silver-working survived well into the seventeenth century, even though many of the articles produced had by then become heavily influenced by Spanish design.[33]

Second, one must recall that in spite of its great mineral wealth (most of which was sent directly to Lima) the Titicaca Basin remained a backward and isolated area throughout Colonial times. Not only was the region remote from the seacoast and separated from it by lofty mountain ranges; the admirable Inca roads were not maintained by the Spaniards, but were allowed to go to rack and ruin soon after the Conquest. Romero points out that in spite of the millions of dollars in precious metals sent to the Spanish crown from the Puno area, there was not even a decent highway over which to transport them.[34] Hence Spanish neglect combined forces with physical geography to prevent the development of widespread trade in this region during the early days of the Viceroyalty. What European merchandise reached the *altiplano* in the sixteenth century was carried from the coast on pack animals. It crossed the high Andes over poor trails, a difficult journey of many days duration.[35] Delivered in the towns of the Titicaca Basin, this merchandise, perforce, fell into the luxury class, available only to the very wealthy. In fact it was not until the building of the southern Peruvian railway in the late nineteenth century that foreign manufactured articles became generally available in highland Peru.[36]

A third factor was the stultifying commercial policy of Spain. By means of a rigid monopolistic system, Spain controlled all trade with Peru—and with the Spanish colonies of the New World generally—and saw to it that all commerce was conducted exclusively through the mother country. Merchandise exported to Peru consisted in the main, moreover, of such luxury articles as fine fabrics, watches, armor, iron and steel, glassware, wines, and fine olive oil.[37] This trade was obviously directed toward the wealthy and elite, and was not intended for general consumption. As Valega has observed, Colonial commerce, which centered upon Lima, did not begin to supply the demands of the total population of Peru.[38] The native tradition of fine craftsmanship, the isolation of the highlands, and the inadequacies of Colonial commerce, therefore, all conspired to foster and promote the existing native Peruvian handicrafts.[39]

Returning specifically to the discussion of ceramics, Spanish porcelains were available in very small quantities, if at all, in highland Peru during the sixteenth and early seventeenth centuries. Native potters thus continued to supply the demands of the Indian population as before the Conquest, and in addition—in some regions—began to produce new forms (especially roof tiles and wine or olive oil jars) for their Spanish overlords.

[30] For a systematic study of the impact of Spanish Colonial culture on that of the neighboring Quechua, see Kubler, 1946.

[31] Elsewhere the writer has summarized some changes that took place during the Colonial era (H. Tschopik, Jr., 1946, p. 511).

[32] Indeed, so highly esteemed were the native fabrics that Spain did her best to hamper the development of Peruvian cloth factories for fear that they would lessen the consumption of Spanish-made textiles (Means, 1932, p. 265).

[33] Vásquez de Espinosa, 1942, p. 475.

[34] Romero, 1928, p. 31.

[35] Vásquez de Espinosa (1942, p. 464) states that, in the early seventeenth century, there were ten posts of the Peruvian Courier Stage, the distance between any two of which represented a day's journey by horse, between Chucuito and Arica, on the coast.

[36] For a discussion of the effects of changing patterns of transportation and communication on highland Peru, see H. Tschopik, Jr., 1947, pp. 15–19.

[37] Means, 1932, p. 223.

[38] Valega, 1939, p. 455.

[39] Cf. H. Tschopik, Jr., 1949, pp. 14–16.

FIG. 59. Mestizo pottery: *Left and right*, glazed bulls from Santiago de Pupuja, Peru. *Center*, painted bull from Ayacucho, Peru. (Courtesy of the Brooklyn Museum.)

In certain areas—particularly in those centers that had specialized in pottery manufacture in pre-Hispanic times—pottery "factories" sprang up. Vásquez de Espinosa mentions the existence of such "factories" in the Arequipa region and in Ica Valley during the early seventeenth century;[40] of the latter he wrote: "It has four potteries which produce plenty of jugs for all the vineyard owners, and their proprietors are the wealthiest and the persons most in demand.[41] It is known, moreover, that such pottery "factories" were well established in Mexico in early Colonial times, and were supervised by Spanish entrepreneurs who were either potters themselves or were at least familiar with Old World techniques. These individuals set up their own small "factories" in Mexico, hired Indian laborers, and taught them the Spanish techniques of glazing and the potter's wheel.[42]

[40] Vásquez de Espinosa, 1942, pp. 484, 499.

[41] *Ibid.*, p. 499.

In the pottery centers of Pucará and neighboring Santiago de Pupuja, "factories" or *talleres* are known to date from Colonial times, and it is most likely that the contemporary institutions in these towns are essentially Colonial in pattern.[43] The *taller* of present day Pucará is a small industry employing from five to six potters. Typically the potters are Indians working for wages under Mestizo supervision. Some vessels are made in molds, most of which open vertically and are composed of from two to four parts, depending upon the article being manufactured.[44] Other vessels are turned on a

[43] Foster, 1948, p. 368. The Mexican Maiolica ware of Puebla owed its origin to Dominican potters of Talavera who, in the sixteenth century, instructed local Indians in the Spanish processes of pottery-making (Barber, 1922, p. x).

[42] The information relating to the contemporary pottery "factories" of Pucará was kindly supplied by Sr. Nicanór Adrián, a resident of that town.

[44] The technique of mold-made pottery is, of course, ancient in Peru (cf. Linné, 1925, pp. 83–90). But since mold-

type of potter's wheel, *torno de eje vertical*, which is operated by the feet. All vessels are glazed and are fired in conical abode kilns (Fig. 59).[45]

By the late eighteenth century, Pupuja potters were producing glazed wares (*loza*) that were said to compare favorably with those of Talavera in Spain; an anonymous manuscript states in regard to Pupuja: "Entre sus efectos son de mucho aprecio las especies de Loza, que por su finura, y lo delicado q' es, no envidia a la q' traen de Talavera."[46] In these regions where pottery was manufactured on a large scale for trade, many Spanish patterns were adopted during the Colonial period, including the potter's wheel, the European-type kiln, mold-made vessels, Spanish shapes (pitchers with spouts, candlesticks, etc.), Spanish design motifs, and glazed decoration.

In other areas—Chucuito, for example—where pottery seems to have been manufactured on a comparatively small scale, primarily for Indian consumption, and where no "factories" appear to have existed, Spanish influence on the local ceramic styles remained negligible. With but slight modifications, traditional forms and traditional techniques of manufacture continued in vogue in the Indian towns. The scholarly Jesuits of the early seventeenth century have left invaluable records of the ceramic forms employed by the Indians of their day. Cobo mentions unglazed ollas, pitchers, jugs, and bowls, as well as vessels of wood and gourd.[47] By far the most important account, however, is that contained in Bertonio's *Vocabulario*.[48] This description is especially significant not only because of its detail, but because it was based on Bertonio's observations in Juli, an Aymara town situated less than fifty miles to the southeast of Chucuito.

In the following list, the various vessels mentioned by Bertonio have been grouped according to form, and, wherever possible, these have been identified with forms in use at the present time. In such cases, phonemic recordings of modern terms follow (in parentheses) those given by Bertonio.[49] The descriptions in quotes have been translated from Bertonio's picturesque (and often difficult) Spanish; for reasons of restricted space, the original Spanish has been omitted.

OLLAS

*phuccu* (p'uk'u): "Olla."

*kauchi* (kauči): "Large olla."[50]

*kayko* (*ʃaiko*): "Small olla or cooking pot."[50]

*chillisaa phuccu:* "Well fired and hard olla."

*chamillku* (*čamiʃko*): "Olla for cooking stew"; elsewhere this is rendered *chamillko ppusca:* "Small olla, or cooking pot."[51]

*vicchi:* "A small, wide-mouthed olla where they put masticated quinoa or maize for chicha."

JUGS AND CHICHA JARS[52]

*huacolla* (*wakuʃa*): "Jug for water or chicha; there are various of them."

*urpu* (*urp'u*): "A very large jug or *guacolla* with a long neck. The same as *makacha*."[53]

made pottery does not appear to occur archaeologically in the Cuzco-Puno region, it is presumed that the Pucará molds are of Spanish origin. It is known that concave, vertically-joined molds were also used in Spain (Foster, 1948, p. 362).

[45] In Cuzco at the present time Spanish-type ceramics are likewise manufactured in small "factories" by Indians under Mestizo direction. The vessels are wheel-made, have some Spanish shapes as well as ring bases, and are painted with glaze paints in designs of Spanish origin (personal communication from John H. Rowe).

[46] From a manuscript in the Archivo Nacional de Lima, entitled *Manual Pronto para el conocim*[to] *de las personas que administran las Almas en este obispado del Cuzco y efectos que da y produce cada doctrina, Año de 1797* (No. 34, Vol. 318, antigua colección de ms., 24 ms. folios). (Personal communication from George Kubler.)

[47] "Las piezas que usan en este menester son no mas que de dos ó tres maneras; ollas de barro sin vidriar, en que antiguamente pintaban diversas figuras, como tambien en los cántaros y demas vasijas; platos de calabazas secas, del tamaño de pequeñas porcelanas, barro y de madera; los de palo se dicen MECA, y los de barro PUCU; y cazuelas medianas de barro que llaman CHUAS" (Cobo, 1890–93, Vol. 4, p. 170).

[48] Bertonio, 1879, 2 vols. In the list that follows the information has, unless otherwise noted, been taken from Volume 2. Since the entries in the *Vocabulario* are listed in dictionary form, it has not been thought necessary to cite page references.

[49] For an explanation of the phonemic notation employed, see La Barre, 1948, p. 8.

[50] Obsolete in Chucuito, but still employed in the La Paz region of Bolivia (personal communication from the late Arturo Posnansky).

[51] Bertonio, 1879, Vol. 1, p. 339. This form is no longer made in Chucuito. Posnansky reports that a cup called *čamiʃko* is manufactured by the Bolivian Aymara (personal communication from the late Arturo Posnansky).

[52] Cobo states that maize, quinoa, and chuñu, as well as clothing, was stored in large pottery jars: "Todo esto guardaban en tinajas, que no tuvieron otras arcas, baules ni escaparates" (Cobo, 1890–93, Vol. 4, p. 171).

[53] Posnansky identifies this form as the Inca aryballus. Although this shape is no longer manufactured in Chucuito, it persists in parts of Bolivia (personal communication from the late Arturo Posnansky). Métraux (1935, p. 108) reports that the aryballus form is still made in the Province of Carangas, Bolivia.

*makacha:* "A very large jug."
*makhma* (*maxma*): "A large vessel (*tinaja*) with little neck." Elsewhere (under *urpu*) he distinguishes the *makhma* from the latter as being a vessel without a neck.
*humihua:* "Small jug."
*ppuñu:* "Jug or vial."
*laqui:* "A small jug that holds a quarter of a *fanega*."

TOASTING VESSELS

*hiuku* (*hiuki*): "Olla for toasting something."

BASINS

*virqui* (today called *ʃata*): "Basin for washing something."

BOWLS AND PLATES

*chua* (*čuwa*): "Food bowl."
*yura chua:* "Deep bowl."
*phuku:* "A small bowl for eating stews or similar delicacies."
*ttalla:* "A large bowl or basin for sending presents."[54]
*sañu palato* (today called *platiʃo*): "Earthen plate."[55]
*pallalla chua* (*paʃaʃa*): "A flat plate, neither deep nor concave."[56]

STOVES

*putu* (*putu*): "Stove where they cook food; sometimes they call it *qhueri*."
*qhueri* (*kere*): "Stove."[57]

BRAZIERS

*tiapu* (today called *braseru*, from Spanish *brasero*): "Brazier of earthenware or iron, fixed in the ground, or portable, used for heating purposes."

MISCELLANEOUS

*chillami* (*čiʃami*): "Urinal, like a chamber pot or a gourd."[58]

It is unfortunate that Bertonio does not give equally detailed information on the techniques of pottery manufacture. What fragmentary bits he does present, however, may be pieced together as follows. Bertonio implies that potters were men by translating the word for "potter," *sañucamana* or *ccopi*, in the masculine gender (*ollero*).[59] The clay for pottery was ground between two stones, and the paste was kneaded either with the hands or with the feet.[60] At some stage before actual construction the paste was steeped in water (*remojado*) and was allowed to sour (*podrir*).[61] Before firing, pottery vessels were burnished with a bone or iron instrument called *kisu*.[62] There are no details as to the painting or firing of pottery, but the former operation was called *quellcatha* while the latter was termed *sañu huakhatha*.[63] Other than these few isolated facts there appears to be no additional information except the observation that rings of rope, called *taipu*, were used as stands for pottery vessels.[64]

Although to date very few post-Columbian sites have been excavated in the Andean area, the archaeological picture of ceramic change during Colonial times appears to be thoroughly consistent with that furnished by documentary evidence. Of the data summarized below, the majority are based on the excavations by Marion H. Tschopik of a protohistoric site called Inca Uyu in Chucuito.[65]

Inca Uyu is a large, rectangular structure, probably a temple or a temple compound, situated in the lower *barrio* of Chucuito village, near the present church of Santo Domingo. The building, constructed of well-cut basaltic blocks, is late Inca in date, and appears to have been in the process of construction when the first Spaniards arrived in the town. From earliest Colonial times Inca Uyu was used as a community rubbish dump, and the collections recovered through excavation shed much light on the nature of the Aymara-Spanish contact situation.

It is clear that Inca ceramics survived the Conquest, but for how long these forms per-

[54] Note that in this case and the latter, some distinction is implied between ordinary food bowls and those used for festive occasions; this distinction is also drawn today.

[55] Bertonio, 1879, Vol. 1, p. 370. Both terms, *palato* and *platiʃo*, are probably borrowed from the Spanish, *plato* or *platillo*.

[56] At the present time the *paʃaʃa* is used almost exclusively as a support, like the Pueblo "puki," in the manufacture of pottery.

[57] Bertonio, 1879, Vol. 1, p. 244. Cobo (1890–93, Vol. 4, p. 170) also describes the built-in pottery and adobe stove.

[58] This form persists among the Bolivian Aymara (La Barre, 1948, p. 101). In Chucuito at the present time, cracked or broken vessels are used as urinals.

[59] Bertonio, 1879, Vol. 2, pp. 54, 308.

[60] *Ibid.*, p. 63.

[61] *Ibid.*, p. 211.

[62] *Kisutha:* "Bruñir el barro por cozer, como haze el ollero, etc." *Kisu:* "El instrumento de huesso, o hierro con que bruñen" (*Ibid.*, p. 303).

[63] *Quellcatha:* "Es propriamente Affeytar, Pintar, o Rascuñar o dibuxar al modo de indios, que pintan los cataros, y otros vasos." *Sañu huakhatha:* "Cozer loca" (*Ibid.*, pp. 308, 286).

[64] *Ibid.*, p. 353.

[65] Owing to a series of unfortunate circumstances, it seems unlikely at the present time that the results of this interesting and instructive excavation will ever be published in full. The collections, which are still in Peru, have never been analyzed in detail. The following summary, therefore, is based on the field notes of Marion H. Tschopik.

sisted in use it is difficult to say. It seems significant, however, that of the thousands of Inca type sherds recovered from Inca Uyu, not a single one exhibited a trace of Spanish influence. A highly similar situation was noted by Rydén in the Jesús de Machaca region of Bolivia. Here the ceramics from two village sites, one late Inca and the other early post-Columbian (tentatively dated at about 1580) were found to be virtually indistinguishable.[66] Yet the presence of sheep and pig bones, as well as of iron implements and European pottery, marked the latter site as post-dating the arrival of the Spaniards. But a single pottery vessel from the post-Columbian site showed any Spanish influence (in shape), and even this resemblance is open to question.[67] For the Cuzco area—the very heart of Spanish occupation in the sierra—John H. Rowe informs me that, although Inca-type vessels continued to be used into the Colonial period, he has never seen an Inca piece bearing European glazed decoration.[68] Thus it appears that, after the Conquest, Inca ceramics continued to be employed for a time in Chucuito and elsewhere, but that these forms were obsolete before foreign wares and European techniques became sufficiently common to influence them. In all likelihood, Inca pottery was replaced and succeeded by the glazed and/or wheel-turned wares produced in the Colonial pottery "factories."

"Non-Aymara" ceramics occurred in the Inca Uyu rubbish deposits in abundance, although it is impossible to date their appearance with anything approaching accuracy. Such wares took the form of roof tiles and wine or olive oil jars, sherds of which were recovered in quantity, as well as a polished red ware, and a glazed ware.

The wine or olive oil jars appear to have reached the sierra in large numbers; many may be seen today in Arequipa and Cuzco, and a fragment was recovered by Rydén in his early post-Conquest Bolivian site.[69] Such vessels from Chucuito were large, massive, and wheel-turned, and their exteriors were glazed green or brown. It is not known whether these jars were products of Spain, or whether they were manufactured in Peru. Certain it is, however, that they were not made in Chucuito.

The red ware is highly polished, thin, with a hard, porcelain-like paste, light cream in color. Most vessels appear to have been smallish jugs or jars, and all were wheel-turned and exceedingly well made. Distinctive of this style are appliqued *adornos* in the form of rosettes. In every respect this ware is dissimilar to the ceramics produced in Chucuito during Colonial times. Although its place of origin is at present unknown, it is possible that it may have come from what is now Bolivia, and similar pieces are said to occur archaeologically on the Peninsula of Copacabana.[70]

The glazed wares were represented principally by ring-based bowls, decorated in green, dark brown, or yellow lead glaze. It could not be determined whether these were wheel-turned. Although no complete specimens were recovered, the designs appear to have been bold, cursive, floral patterns. Like the red style, the glazed wares were foreign to Chucuito, although not unlike contemporary glazed pieces from Pucará and Santiago de Pupuja to the north of Puno. In fact, until evidence to the contrary is forthcoming, it is presumed that the glazed specimens from Chucuito originated in the Pucará–Pupuja region.

In the light of what has been said regarding Spanish Colonial commerce, it seems significant that no sherds in the Inca Uyu collection could be positively identified as having come from pottery vessels manufactured in Spain. Sherds of Chinese porcelains, on the other hand, were encountered in rather surprising numbers, and it is not unlikely that their presence in the Peruvian sierra is due to the illicit operations of the famous Manila Galleon.[71]

Along with these new styles, which were employed, but not manufactured, in Colonial Chucuito, were encountered thousands of

[66] Rydén, 1947, pp. 300, 320.

[67] *Ibid.*, p. 312.

[68] Personal communication from John H. Rowe. George Kubler has brought to my attention a single Spanish-influenced aryballus in the Museo Arqueológico in Cuzco. This piece is glazed, and figures Creole types, as well as negroes; it is presumed to date from 1600–1650. Such examples, however, are very unusual indeed.

[69] Rydén, 1947, Fig. 114, p. 263; pp. 312–13.

[70] Personal communication from Sr. José María Franco Inojosa, Inspector of Ancient Monuments for the Peruvian Government.

[71] During the sixteenth and seventeenth centuries, in spite of the efforts of the Spaniards to prevent such traffic, contraband Oriental goods entered Peru in quantity. Except for a brief interval between the years 1579 and 1582, when commerce with the Far East had royal sanction, trade with the Orient was strictly prohibited until 1799 (Schurtz, 1939, pp. 366–7).

sherds of local Aymara pottery. Those Aymara forms made during the period of Inca occupation persisted in use, virtually without change.[72] Save for their association with the Spanish-type Colonial vessels, and with roof tiles, it would be impossible in most cases to assign them with assurance to an Incaic or to a Colonial horizon.

Other specimens show some slight Spanish influence. Some bowls exhibit ring bases, others flaring lips (Fig. 60, *g–h*), and a few cup forms now appear (Fig. 60, *d*). With regard to the Aymara spoutless jug (Fig. 60, *a*, *c*), the question is somewhat puzzling. Although this shape may have been present earlier, such jugs may first be identified with certainty in horizons of Colonial date. Possibly the jug is an adaptation of the Spanish pitcher; yet this shape existed in the southern Andes in pre-Hispanic times, and may well have been a traditional Aymara form.[73] In regard to design, but a single sherd of native Aymara pottery from Chucuito shows Spanish influence, and this is in subject matter rather than in style. The sherd in question depicts a rooster, which clearly marks the vessel as post-Columbian.[74] Finally, no examples of native Aymara types from Inca Uyu gave evidence of having been wheel-turned or mold-made, and glazed decoration was entirely absent.

Even though some Colonial pottery "factories" probably existed in the Cuzco region during the era of Spanish rule, native Quechua wares continued to be manufactured in the same area, and these appear to have been influenced by Spanish ceramics to the same slight degree as the Aymara wares. Rowe writes me: "In 1946 I managed to isolate a style which I am quite sure is early Colonial, representing what succeeded the Cuzco Series. I am calling it the K'uychipunku Series. The ware and the proportions are the same as in the Cuzco Series, and many of the shapes are identical, but in addition there are plates with a lip, bowls with a ring base, and some wide-mouth jars. The designs are more in the direction of Chucuito Polychrome: insects, flowers, plants, etc., mingled with geometric motives, instead of the almost purely geometric style of the Imperial period. In addition to the older three colors, black, red, and white, there is a fourth, an orange, used on most pieces. How long the K'uychipunku Series lasted, or what succeeded it, I cannot say. So far I only know the ware from the immediate vicinity of Cuzco, but it may have a wider distribution."[75] Like the Aymara pottery, this Colonial Quechua style was not wheel turned, and lacked glazed decoration.

To sum up the foregoing, the coming of the Spaniards dealt a severe blow to native Aymara culture. Socio-political institutions were greatly modified; a new religion was introduced; plow agriculture, as well as cattle, sheep, wheat, and barley became an integral part of Aymara life; steel tools replaced those made of bronze; but although new forms of ceramics sprang up in certain centers as a result of direct supervision by Spaniards and Mestizos, native Aymara pottery manufacture remained in large part uninfluenced.

## CONTEMPORARY POTTERY

### MANUFACTURE

Although ceramics are no longer produced in the town of Chucuito proper (if, indeed, they ever were), pottery continues to be manufactured in three of the outlying *ayllus* that fall within the political jurisdiction of the village. In the *ayllus* of *qoṭa* and *paḷaḷa*, situated on the broad pampas bordering Lake Titicaca, there are said to be some fifteen households producing pottery.[76] In *q'arukaya ayllu*, located in the high *puna* region to the west of the lake, there are reported to be at least thirty men actively engaged in the manufacture of ceramics.

According to Chucuito informants, the manufacture of pottery, *saña*, is an exclusively masculine pursuit.[77] That this pattern is ancient is suggested—as mentioned earlier—by the fact that Bertonio, in his seventeenth century Aymara dictionary, gives the word for "potter" in the masculine gender. In post-Colonial times,

[72] Pottery figurines representing both humans and animals, as well as pottery spindle whorls, were also encountered in Inca Uyu.

[73] For pre-Hispanic jugs of the Arequipa region, see Kroeber, 1944, Pl. 1, *A;* Pl. 2, *A*. For the Puno region: M. H. Tschopik, 1946, Fig. 20, *a;* Fig. 21, *f*. For the Bolivian *altiplano:* Rydén, 1947, Table 2: "small rimmed vessels."

[74] M. H. Tschopik, 1946, Fig. 14, *h*. This vessel is in the Chucuito Polychrome style.

[75] Personal communication from John H. Rowe.

[76] Since this figure refers to extended families rather than to individuals, there may well be double that number of actual potters.

[77] At the present time a potter is designated by the bastard Aymara-Spanish word, *sañiro*.

other writers have noted that Aymara potters were men.[78] But while they do not specialize in pottery manufacture, Aymara women assist their husbands, and children also may perform the simpler tasks. Chucuito informant Enrique Ramos regularly received assistance from several members of his family. His wife helped to prepare the clay, to model small bowls, and to slip vessels. His daughter mixed pottery paints, while his son turned the pots while they were drying, fetched fuel for firing, and assisted in other capacities.

### FORMS AND USES

Although certain specific vessel shapes—particularly those associated with the several Inca wares—are no longer manufactured in the Chucuito region, it seems significant that the range of vessel forms is today almost as great as that known to the Aymara of Inca or Colonial times (Fig. 60).[79] With the exception of the two types of chicha jars, which have in recent times become somewhat obsolescent owing to the influx of commercially distilled liquors, and of the water jug, which is gradually being replaced by the gasoline tin, all forms are commonly used throughout the District of Chucuito, by both Indians and Mestizos. In the case of the latter, however, who comprise the "aristocracy" of the social hierarchy, native wares tend to be restricted to the kitchen and to the bosom of the family; for table service especially when guests are present, Mestizos use glazed "china" and glassware manufactured in Lima or imported from abroad. The forms in current use may be summarized as follows:[80]

*Cooking pots*, p'uk'u (Fig. 60, *i*). The globular cooking pot ranges in size from several inches to 2 or more feet in diameter. Depending upon size it is designated *haču-*, "large," or *hiska-*, "small," *p'uk'u*.[81] This form has two vertically placed strap handles, is never decorated, and rarely even receives careful washing, since grease is thought to make it more water tight. Because the Aymara usually employ smouldering dung for fuel when cooking, the exterior walls of cooking pots become heavily carbonized. In addition to serving as a cooking pot, the olla is used to store grains, balls of yarn, spindles, and other small objects. Occasionally very large vessels of this type are employed to boil dye, or to cook for guests during a fiesta.

*Jugs*, čatu (Fig. 60, *a*, *c*):[82] The spoutless, single-handled jug or pitcher is employed for hauling water and for storing it in the house. Although this form is slipped and stone polished, it is said never to be painted.

*Toasting vessels*, hiuki (Fig. 60, *b*). These vessels take the form of squat, wide-mouthed ollas, and are supplied with a single vertically placed strap handle. They are said never to be slipped or painted. The *hiuki* is employed principally for preparing *hampi*, or toasted grain (maize, barley, or quinoa), but is also used on occasion as a cooking pot.[83] In toasting grain the vessel is placed on a burner of the pottery stove until the contents have become parched. Glowing coals are never placed inside.

*Basins*, ʃata (Fig. 60, *k*).[84] The *ʃata* is a large, shallow basin, ranging in diameter from 10 inches to some 3 feet. The rim flares in a lip, and ordinarily the vessel is supplied with a single vertically placed strap handle. Basins are used for washing (clothes, the hair, grains, vegetables), for peeling potatoes, and as a mixing or serving bowl. They are not, however, employed in cooking. The everyday *ʃata* is slipped and polished, but not painted. For fiestas or marriages special basins are employed that bear painted decoration in red and white. Those used in marriages have crosshatched or zigzag patterns around the rim, while the center is painted with a figure of a man and a woman holding hands. On festive occasions these vessels are used for serving the guests.

*Chicha jars* (Fig. 60, *j*, *l*). Two types of chicha vessels are manufactured, the fermentation jar, *maxma*, and the storage jug, *wakuʃa*. The former has a wide mouth and a short neck; it is in vessels of this type that the masticated or sprouted grain is allowed to ferment. The *wakuʃa* has a tall, restricted neck, and is employed to store chicha after the beverage has been prepared and strained. The mouth is stopped up with a wad of green *totora* rushes, or is covered with an inverted bowl to prevent evaporation. Chicha vessels of either type range in size from about a foot in height to over 3 feet. Most frequently they are slipped, but unpainted. Occasionally, however, the *wakuʃa* is decorated with vertically arranged zigzag designs, painted in red and white. Vessels of either type are supplied with a pair of vertically placed strap handles, located well down the sides. Occasionally the *wakuʃa* is in addition furnished with

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[78] Cf. Chervin, 1908, p. 218; La Barre, 1948, p. 101. Of all authorities, Forbes (1870, p. 254) alone states that Aymara women make pottery. Regarding the modern Quechua, Mishkin (1946, p. 433) writes: "Both men and women make pottery, but the majority of potters are men."

[79] As noted earlier, the Inca aryballus form survives in parts of Bolivia. Although pottery spindle whorls were manufactured up until a generation ago in Chucuito, none are said to be made at the present time.

[80] For illustrations of some Bolivian Aymara forms, see Forbes, 1870, Pl. XX, 4.

[81] Additional terms employed to designate the olla in Bolivia are *kauči* and *ʃaiko* (see p. 202).

[82] La Barre (1948, p. 101) states that in the La Paz region of Bolivia, the pitcher is designated *wakuʃa*. It is more likely, however, that this term refers more properly to the small-mouthed chicha jar.

[83] La Barre (1948, p. 101) also mentions crucibles for metallurgy called *hiuki*.

[84] The Bolivian Aymara term for "basin" is *lamana* (La Barre, 1948, p. 101).

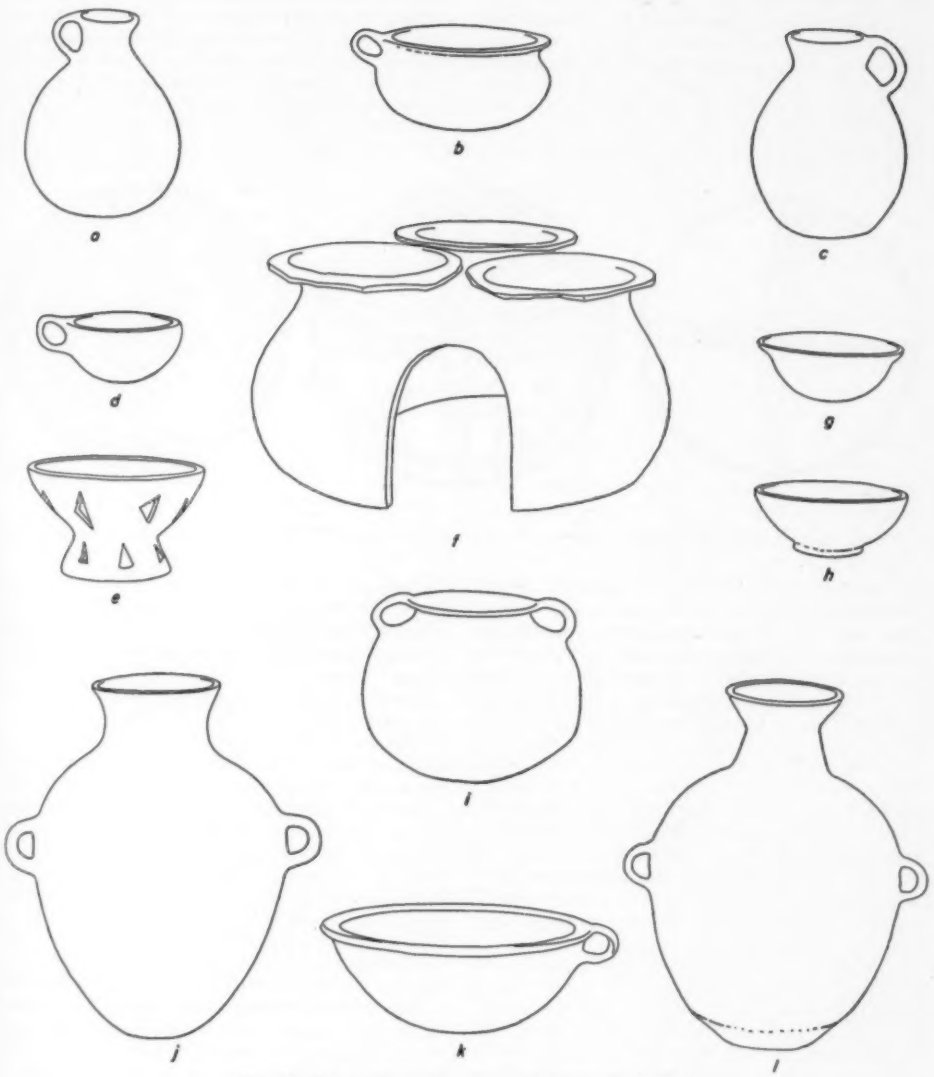


FIG. 60. Contemporary Aymara vessel shapes. (Scale 2/7.)

a protruding nubbin on the shoulder to facilitate carrying the vessel with a tump-line.

*Bowls* (Fig. 60, *g–h*). The ordinary bowl, *čuwa*, is fairly standard in size, and has a diameter of 6 or 7 inches and a height of about 3 inches. Most bowls of this type have ring bases, and are slipped and painted with cursive designs in red or red and white (Fig. 61, *a–c*). These vessels are used principally as food bowls, and are held to the lips by the base during meals, since spoons are not employed in eating.

*Braziers*, braseru (Fig. 60, *e*). Although the antiquity of this form among the Aymara is somewhat doubtful, the brazier is employed at the present time as an incense burner. Vessels of this type are about 6 inches in height, and take the form of a flaring bowl with a high ring base. At intervals the walls are cut through with triangular perforations. Such vessels are not slipped and painted, since they soon become carbonized from the glowing coals and burning resin placed within. Very occasionally braziers are employed for broiling

FIG. 61. Contemporary Aymara bowl designs: *a*, *b*, red on pink-orange; *c*, red and white on red-orange. (Scale 2/7.)

The *čuwa* is also filled with melted fat, supplied with a rag wick, and used as a lamp, on which occasions it is designated *meča čuwa* (from Spanish, *mecha*, "wick").[85] On other occasions, the bowls are employed as covers or lids for ollas and chicha jars, or are filled with glowing coals and used as incense burners. A second type of bowl, designated *platiļo* or *platiļ čuwa*, has a flaring lip and lacks the ring base. These bowls always have painted decoration in red and white, and are employed as food bowls in weddings and on other festive occasions. Formerly, a generation ago, the bride and groom at a wedding jointly ate a special dish, *timṕu*, from such a bowl in order to symbolize their union.

*Cups*, haruči (Fig. 60, *d*). The cup form is encountered less frequently than the other types of vessels, but is far from being uncommon. It is about the size of a teacup, and is slipped, and painted in red. Such cups are employed for drinking water or herb teas, but are not used for chicha.

*Stoves*, putu *or* kere (Fig. 60, *f*). The pottery stove, provided with one or more holes on which to place cooking vessels as well as an opening in the front for fuel, is widespread among the Peruvian Aymara, and has also been reported for Bolivia.[86] Such a stove averages about a foot in height, and is never painted, but may occasionally be slipped in red. At times the stove is permanently embedded in an adobe hearth in a corner of the kitchen structure. The "single burner" form is occasionally carried to the fields to be used in preparing the midday meal.

*anticuchos*, or pieces of beef or lamb heart cooked on skewers. More frequently, they are used in ceremonials, in purifying a house where a death has occurred, and to produce an herb smoke thought effective in the treatment of some diseases.

*Figurines* (Fig. 66). At the present time pottery figurines are manufactured in variety for use in the Fiesta of Santa Barbara among the Peruvian Aymara, and in the *alasita* festival of Bolivia.[87] La Barre writes that pottery dolls, llamas, and sheep, as well as figurines of *eqʿeqʿo*, the good luck deity, are modeled by the Bolivian Aymara and either kept in the houses or buried to bring good fortune.[88] Forbes describes small clay effigies in human form that are employed in sorcery.[89] The figurines of Chucuito are varied, and exceedingly well executed; although bulls predominate, llamas, alpacas, calves, sheep, dogs, horses, as well as miniature pottery vessels, are also represented. The figurines range up to about 6 inches in height, and are often painted in red to represent the proper markings of the animals. During the Fiesta of Santa Barbara in Chucuito, the figurines are purchased in a mock market, and placed on the "grounds" of miniature stone houses constructed for the occasion in order that they may bring their owners wealth and prosperity during the forthcoming year. Such figurines also serve as children's toys.

With the exception of braziers, and of the specially painted food bowls and basins manu-

[85] La Barre (1948, p. 101) states: "The *meča čua* is a lamp made like a crude stemmed wine-glass; llama or other animal fat burning with a wool wick furnishes the light."

[86] Bandelier, 1910, p. 70; Forbes, 1870, p. 254, Pl. XX, Fig. 3.

[87] For a description of the *alasita* festival of *eqʿeqʿo*, the good luck diety, see La Barre, 1948, pp. 195–6.

[88] *Ibid.*, p. 101.

[89] Forbes, 1870, p. 236.

factured for use during fiestas, there is no differentiation between utilitarian vessels and those intended for ceremonialism. In animal sacrifices, ordinary basins and food bowls are employed to catch the blood. In other rites, the everyday *čuwa* is used as an incense burner. In addition, the pottery jugs buried with the dead on the Peninsula of Chucuito are merely new vessels designed for everyday use.

In Chucuito broken vessels are mended by drilling pairs of holes along the break and lacing the two sides together with rawhide thongs or with fiber cordage.[90] Cracked basins are bound around with rawhide under the rim. Rough protuberances, called *ǩičičo*, are left when the vessel is made in order to serve as a support for the rawhide in the event that the vessel should crack. In parts of Bolivia, a type of glue is prepared from fresh pig liver, and is employed in mending broken pottery.[91] Although, as stated earlier, special pottery urinals, called *čiɬami*, are made by the Bolivian Aymara, broken vessels are used for this purpose in Chucuito. Cracked vessels are also used as storage containers, and large potsherds are placed on the roofs of houses to assist in holding down the grass thatch. Other potsherds are used for carrying live coals, or are ground with a stone to manufacture pottery scrapers.

## CERAMIC TECHNOLOGY

The informant from whom the following technological information was obtained—Enrique Ramos—was a man of some 43 years of age who was a native of *qoɬakači* in *q'arokaya ayllu*, and who had learned the craft at the age of 15 from his father. At the time when the study was made, he resided in Chucuito village with his wife and two children.

Since Ramos considered the clays in the vicinity of Chucuito village unsuitable for pottery, he made a trip to his home in *q'arokaya ayllu* to dig the proper materials and to obtain sand for temper.[92] The clays are called *morad ǩinko*, "purple earth" (from Spanish, *morado*, "purple") and *čupika ǩinko*, "red earth." The former is a reddish brown ferriferous clay, while the latter is almost vermillion in color. The sand, called *ñanko čaɬa*, "white sand," or *qori čala*, "gold sand" (because the sand contains bits of mica), was obtained from a dry river bed. In preparing the paste, the proportions, according to measurement, are an olla of "purple earth," an olla of sand, and a bowlful of "red earth." Once they have been moistened, the clays are called *ñeǰe*, a term that also designates the paste.

The dry clay is ground on a stone "rocker mill" by Ramos' wife, who employs a heavy ovoid cobble, rocked from side to side, as a "mano" (Fig. 62, *upper left*). After grinding, the clay is placed in an olla, moistened with water, and allowed to to stand and "sour" for several days. In preparing the paste, the wet clay is emptied onto an old poncho or hide, and the sand added. Ramos kneads the lump of paste with his bare right foot, while his wife works it with her hands (Fig. 62, *upper right*). Now and then additional sand is added to the paste, and from time to time water is sprinkled over it. At intervals Ramos tests the paste by pinching off a pellet. Since no cracks appear, he at length decides that it is ready, and places it on a flat stone, wrapped in a wet rag. "When it is ready, you can see the specks of gold in it."

Following the preparation of the paste, Ramos seats himself on a folded poncho and places a flat stone slab in front of him to serve as a work surface. Beside him are a series of flat pottery plates, *paɬaɬa*, to be employed as supports for the growing vessels.[93] A cup of water and various pottery-making implements—sherd scrapers, wiping rags, sticks, an old knife, etc.—are placed conveniently at hand. Taking up a lump of clay, he pats it into a disk between his palms and then, holding this in his left hand, he beats it with his right fist, turning it constantly with a tossing motion (Fig. 62, *bottom*). An almost hemispherical bowl results. Placing this base on one of the pottery plates, he rotates it constantly in a clockwise direction, thinning the walls into a flaring bowl form (Fig. 63, *a*).

Taking a piece of moistened felt, *hiskaraña*, the potter folds it over the rim, meanwhile

[90] This method is ancient in Peru (cf. Linné, 1925, p. 157).

[91] La Barre, 1948, p. 101.

[92] Either sand or sherd temper is employed by the contemporary Quechua potters (Linné, 1925, p. 33, table to Map 3a). Ramos denied the use of sherd temper by the Aymara.

[93] These are in every way similar to the familiar "puki" of the Pueblo Indians of the southwestern United States. It is doubtless to these that Linné (1925, p. 95, Fig. 28) refers when he writes that the Quechua use a "sort of potter's wheel." As Castro Pozo (1924, p. 488) has pointed out, however, the true potter's wheel is unknown to the Indian communities of highland Peru.

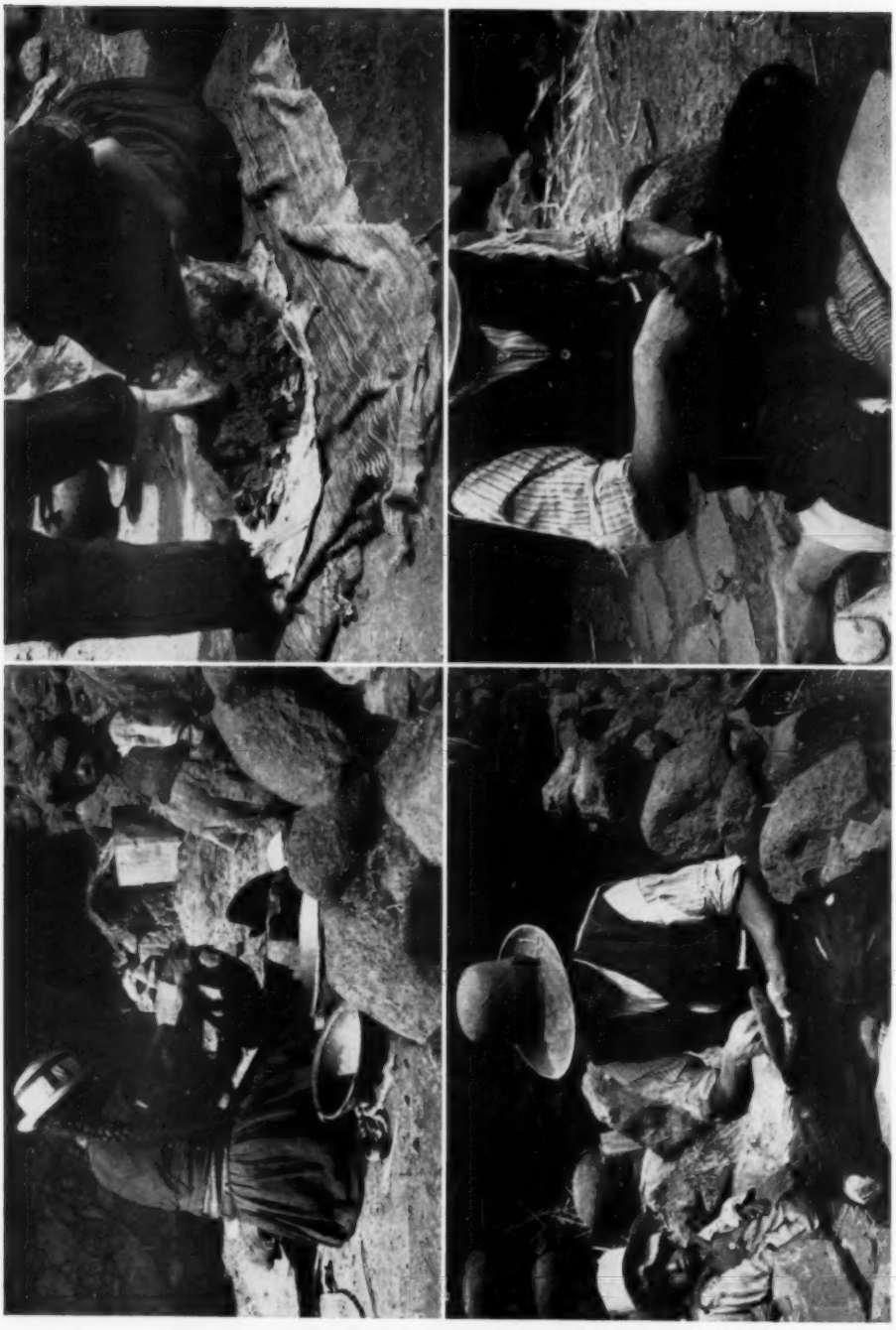

FIG. 62. Construction of an Aymara vessel: *Upper left*, grinding clay. *Upper right*, mixing paste. *Lower left and right*, modeling vessel base.

turning the growing vessel in a clockwise direction with his right hand. The interior is then scraped with a sherd scraper, *haqoña*, while his left hand supports the walls of the pot. The motion is upward and outward, and serves to thin the walls as well as to smooth the inside. Excess clay is scraped off the scrapers and added to the supply of paste, and at intervals the scrapers are washed. If a pebble is encountered in the vessel's surface, it is picked out and the hole chinked in with paste.

When vessels have reached this stage in construction they are set aside in the shade until they become firm, but not too dry. Thus several vessels (in this instance, five) are in the process of construction simultaneously. With the exception of the hemispherical food bowls, which are hand modeled directly, without the aid of a pottery support, the initial stages of construction are identical for all vessels.

After a vessel bottom has become firm, a matter of approximately an hour, work on it is resumed. A sausage-like fillet of paste is rolled out between the palms, and is added counter-clockwise while the base is rotated slowly in the opposite direction (Fig. 64, *upper left* and *upper right*). Each fillet forms a closed circle or ring (Fig. 63, *b*). The suture resulting from the addition of the fillet is then obliterated both inside and out by means of the thumbs and fingers, after which the exterior is scraped from the bottom upward with a moist flat stick, *ankatoqe hakoña*, and inside with the sherd scraper (Fig. 64, *lower left*). At intervals, both surfaces are carefully smoothed with the felt rag and water. When one fillet has been incorporated successfully into the vessel walls, another is rolled out and added as before. In the case of the average basin or toasting vessel, a single fillet is added to the hemispherical base; an average olla, however, requires the addition of two or three fillet rings, each successively smaller in diameter; and the jug three or four (Fig. 63, *c*). When the requisite number of fillets have been added, the rim is made to recurve by scraping inside and at the same time by bearing outward and downward on the rim with the fingers (Fig. 63, *d*). Then, by working with the sherd scraper inside, and by rotating the vessel slowly, the walls are made to bulge outward (Fig. 63, *e*). Finally Ramos takes small pellets of paste and obliterates on the exterior surface the line of junction between the upper and lower halves of the vessel. After a final

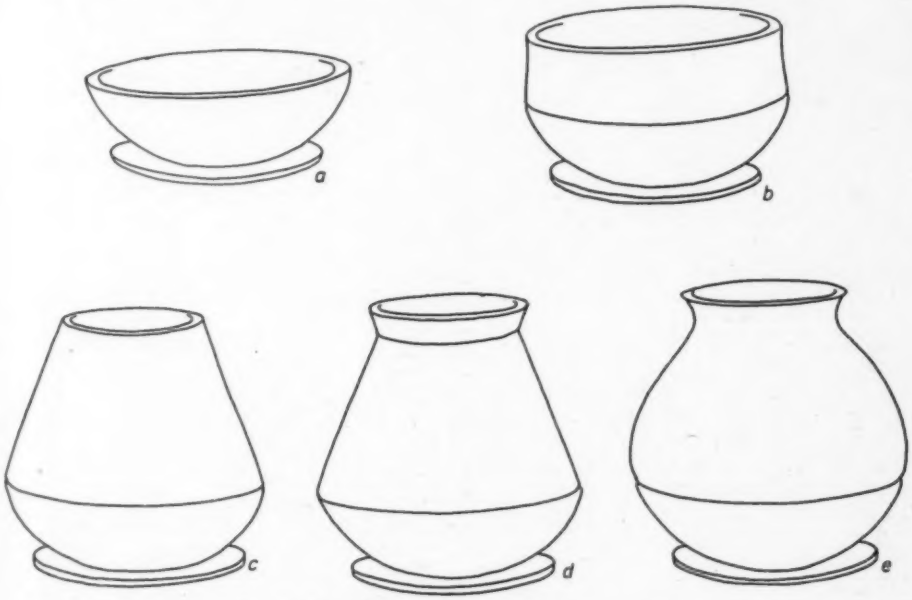


FIG. 63. Stages in the construction of an Aymara vessel.

FIG. 62. Construction of an Aymara vessel: *Upper left*, grinding clay. *Upper right*, mixing paste. *Lower left and right*, modeling vessel base.

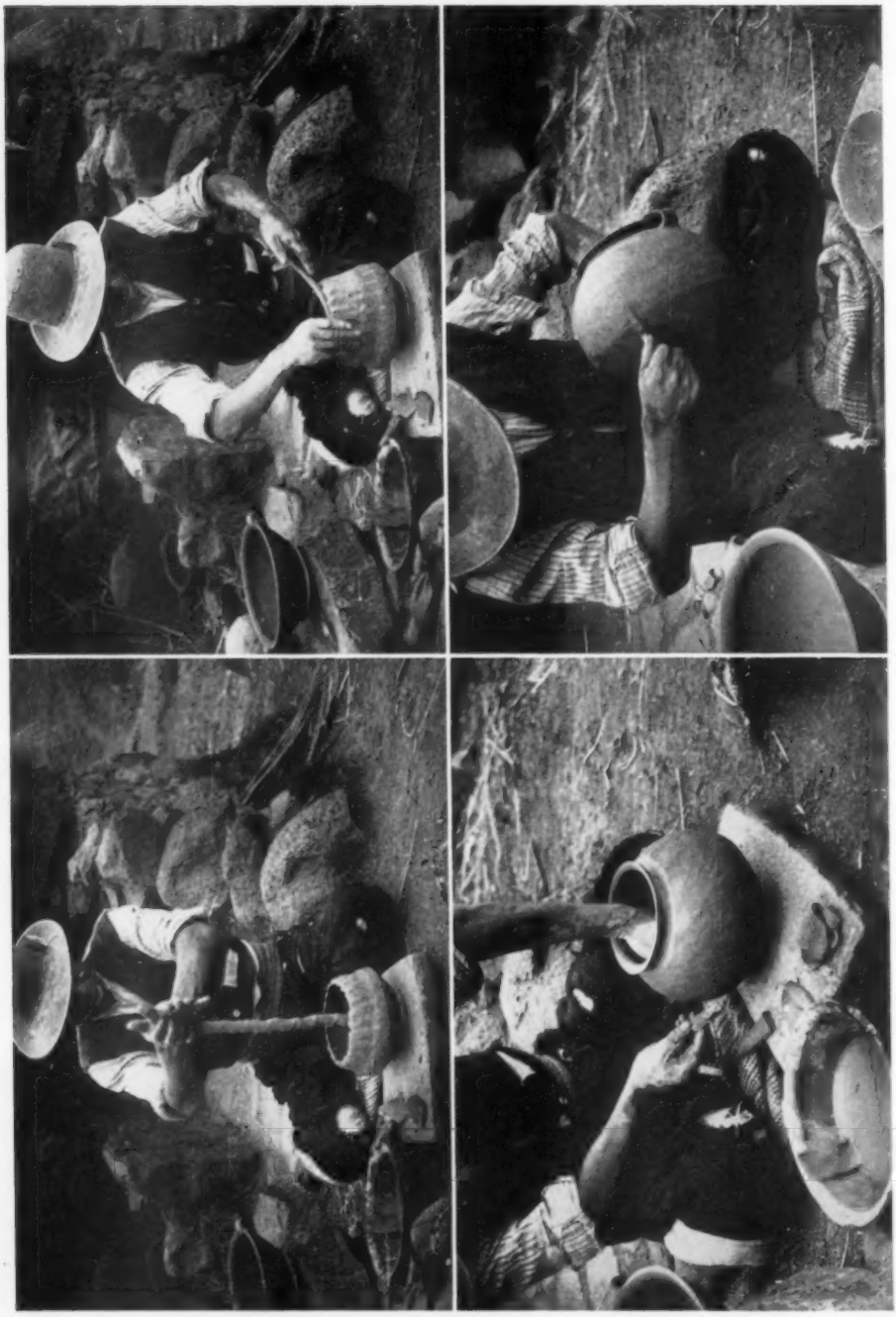

FIG. 64. Construction of an Aymara vessel: *Upper left*, rolling fillet of paste. *Upper right*, adding fillet of paste. *Lower left and right*, scraping vessel.

smoothing with water, the vessel is again set aside to harden in the shade.

Once firm, those vessels that require them are supplied with strap handles (Fig. 65, *upper left*). A small flat strip of clay is pinched into shape, pressed onto the pot's rim, and water-smoothed. The other end is pressed against the vessel wall, and a pellet of paste is added inside (between the handle and the wall) for additional strength. As the handle is attached and smoothed down by the fingers and water, a stick placed inside prevents the vessel walls from sagging. In some instances—especially in the case of jugs—a handle is attached by making a splayed cleft in one end so that it grips the vessel's rim both above and below. In the case of the ordinary food bowl, the ring base is simply a doughnut-shaped fillet that is attached to the bottom by means of pressing and smoothing with the fingers.

The manufacture of a bowl requires between 10 and 15 minutes, while the average basin or toasting vessel takes from 20 to 30, and the olla or jug between 30 and 40 minutes.

When the pots have dried for several hours, the potter goes over them carefully with a knife, shaving off irregularities, carving off the marks left by the pottery support, and completing the obliteration of the junction between the upper and lower halves of the vessel (Fig. 64, *lower right*). All protruding pebbles are dug out, and the cavities filled with bits of paste moistened with the tongue. "If there is a stone in it when it is on the fire, the pot will break." Finally the vessels are dried for three days, the first in the shade and the last two in the sun. "When the pots are in the sun, you must turn them around so that they dry all over; if you don't, they will split."

After the vessels have dried thoroughly, most of them are slipped, and some are painted. The slip, *kaxoña*, is prepared by grinding small pieces of a hematite-stained clay, *sañiwa*, to a powder and then mixing it with water to the consistency of heavy cream. Before grinding, this pigment is a dark reddish brown, but when it has been mixed with water it takes on a yellowish orange color. After firing, however, the slip as well as the paste ranges from pink, through brick red to orange.[94]

The paints in use at the present time are a dark hematite red, *tako*, and one of two white pigments, *katawi* or *kontoya*.[95] The *tako* fires to a dark, matte red, while the white after firing is chalky and tends to smudge or rub off. Although Ramos remembers that black paint was employed in his father's day, and is still occasionally used in parts of the Peninsula of Chucuito, he has forgotten the method of preparing this pigment. The paints as well as the slip are ground either on a stone slab with a cobble or in the small stone mortar ordinarily employed for grinding condiments. Each is mixed with water in a separate pottery bowl, or in a large potsherd.

The vessels are slipped by smearing on the pigment either with the hand or with a rag. After slipping, they are allowed to dry in the sun for at least an hour, after which the pots are burnished, *ɟunkuña*, with a smooth pebble, *kapačika q'ala*.[96] Painting is accomplished by means of a small brush, *pintaña*, manufactured from stiff llama or horse hairs tied to a stick by a string.[97] The brush is held like a pencil and manipulated free hand, without touching the fingers to the vessel's surface (Fig. 65, *upper right*). Pots are said not to receive further polishing after they have been painted. Before firing they are again allowed to dry for several hours.

At the present time designs are cursive, rapidly executed, and, on the whole, rather poorly drawn (Fig. 61, *a–c*). The range of motifs, however, is considerable, and both geometrical and naturalistic designs are represented. The more common motifs are designated as follows: *ɟenɟoɟenɟo*, "zigzag" (Fig. 61, *a*); *kokosa*, "crossed" (crosshatched, Fig. 61, *c*); *ɟenɟo*, "twisted" (a rosette); *lika*, "flower," or *likala*, "painted with flowers;" *uli*, "dove" (Fig. 61, *b*); *waɭpa*, "chicken;" *čoq'a* (a lake bird, possibly a gallinule); *wiskača*, "viscacha"; *sučči* (a "cat fish"); *warawara*, "star." Occasionally human figures, called *haqe*, "man" or *warmi*, "woman," are employed.

Fig. 64. Construction of an Aymara vessel: *Upper left*, rolling fillet of paste. *Upper right*, adding fillet of paste. *Lower left and right*, scraping vessel.

[94] The mica inclusions are apparent in the paste after firing.

[95] While *katawi* was identified as calcium carbonate, the pigment known as *kontoya* was not collected. All of these pigments, as well as the slip, were gathered by Ramos in the *pampa* country to the southwest of Chucuito village.

[96] These pebbles are so called because they are obtained by trade from the Quechua of the Peninsula of Capachica. Linné (1925, p. 107) writes: "The Quichua first polish their clay vessels with a piece of calabash, then with a piece of leather."

[97] The native term for "paint brush" has been forgotten; the word in use at the present time is derived from the Spanish *pintar*, "to paint."

FIG. 65. Construction of an Aymara vessel: *Upper left*, adding handle. *Upper right*, painting bowl. *Lower left*, building kiln. *Lower right*, firing vessels.

The firing of pottery vessels takes place on a rise or hillock in order to take advantage of the prevailing wind from the lake. No preliminary fire is kindled to dry out the ground; instead, dry cow dung is spread out on the ground in a circle roughly 2 to 3 feet in diameter. Around this area rough field stones are arranged in a ring; none, however, are employed as supports for the vessels during burning. Ollas and large jars are first placed in the circle, bottom up, and bowls and smaller pots are piled over them in inverted position (Fig. 65, *lower left*). Dry *ichu* grass tinder is stuck in between the vessels and lighted, while small chunks of manure are scattered lightly over the pots. No attempt is made to fill in all the intervening spaces with dry dung. When all of the vessels have been covered, the potter's wife blows up the fire and feeds it with additional straw and manure (Fig. 65, *lower right*).[98]

The kiln, called *p'uk'u pičaña*, does not flare up, but smoulders and smokes. It is allowed to burn until all of the fuel has been consumed, usually a matter of about two hours with sufficient wind. During the firing, holes are poked through the burning manure with a stick in order to improve the draft. When the firing has been completed, the vessels are removed from the ashes with a long pole, and allowed to cool gradually. The slipped and painted pieces then receive a final polishing with a greasy cloth.

### SPECIALIZATION AND TRADE

Specialization in manufacture is a widespread pattern in the Peruvian highlands at the present time. Thus in the Puno region, Pucará specializes in pottery making, Ichu produces onions in quantity and manufactures sandals from old automobile tires, Chucuito specializes in the making of felt hats, Ilave in wool and yarn, and Juli in textiles. A similar situation prevails among the Bolivian Aymara. With respect to pottery manufacture, Bandelier writes: "... pottery is not made on the Island [Titicaca] but at various places on the Puna, as, for instance, at Ancoraymes, on the northern shore of the Lake; and it is bought either at the Copacavana fairs or an on occasional voyage by balsa to that village or to Achacache."[99]

Within a given Aymara community, still higher specialization may be noted. In the District of Chucuito, for example, hat making is confined almost exclusively to two *ayllus* and the village, while a third *ayllu* produces coca lime and edible clay, and three additional *ayllus* manufacture pottery. Within these three pottery-making *ayllus*, however, still narrower specialization takes places. The two lakeshore *ayllus*, *qota* and *paḷaḷa*, manufacture basins, toasting vessels, pitchers, and pottery stoves, but no ollas and no painted vessels of any kind. The pampa *ayllu*, *q'arukaya*, on the other hand, specializes in the production of ollas, chicha jars, and painted vessels of all types; stoves, basins, toasting vessels, and pitchers, however, are not made here.[100] It should be noted that certain pottery forms commonly used in Chucuito are not manufactured anywhere in the District. Thus incense burners are purchased either in Puno, or in the Quechua pottery centers to the north of that town, while all of the figurines for the fiesta of Santa Barbara come from Acora, to the southwest (Fig. 66). In addition, nearly every family in Chucuito, Indian and Mestizo, owns at least a piece of glazed ware from Pucará or Santiago de Pupuja, while all Mestizos, as stated earlier, own manufactured "china" ware.

Household inventories for representative Aymara families of different economic circumstances in Chucuito revealed considerable differences in the numbers of pottery vessels owned by each.[101] In the listing that follows, other vessels and containers of similar functions have been included for purposes of comparison.

*Wealthy family* (Manuel Corrasco): 14 ollas, 11 jugs, 5 toasting vessels, 7 basins, 3 chicha jars, 2 fermentation jars, 45 bowls, 13 cups, 4 stoves, 2 incense burners, 9 figurines, 5 glazed pieces. In addition: 7 metal candlesticks, 2 wooden bowls, 3 kerosene lamps, 6 enamel basins, 2 enamel pitchers, 3 wooden barrels, 8 gasoline tins.

*Family of medium circumstances* (Juan *kurasi*): 11 ollas, 2 jugs, 3 toasting vessels, 7 basins, 1 chicha jar, no fer-

Fig. 65. Construction of an Aymara vessel: *Upper left*, adding handle. *Upper right*, painting bowl. *Lower left*, building kiln. *Lower right*, firing vessels.

[98] The Quechua build a rough kiln of pots that have been spoiled in previous firings, and employ cattle dung for fuel (Linné, 1925, p. 124). In the Corapuna region of Arequipa Department, pots are fired in a shallow depression, surrounded by llama dung and covered with dry grass (Bingham, 1915, p. 257).

[99] Bandelier, 1910, p. 70. Pottery manufacture is equally localized among the modern Quechua (Mishkin, 1946, p. 433).

[100] The *q'arukaya* potter, Enrique Ramos, who supplied the information for the present study, stated that he made pitchers, basins, and toasting vessels for his own family, but never for trade.

[101] These inventories will be published in full at a later date.

mentation jars, 19 bowls, 5 cups, 2 stoves, no incense burners, 5 figurines, 2 glazed pieces. In addition: 3 enamel pitchers, 4 enamel basins, 1 kerosene lamp, 2 wooden bowls, 4 tin candlesticks, 8 bottles, 3 gasoline tins.

*Poor family* (Daniel *čaɬča*): 7 ollas, 2 jugs, 1 toasting vessel, 2 basins, 1 chicha jar, 1 fermentation jar, 17 bowls, no cups, 1 stove, 1 incense burner, 1 figurine (broken), 2 glazed pieces. In addition: 2 wooden bowls, 3 tin cups, 1 tin oil lamp, 3 gasoline tins.

*Poor family* (Eusebio *čoqe*): 8 ollas, 2 jugs, 2 toasting vessels, 3 basins, 1 broken chicha jar (used as a urinal), no fermentation jars, 12 bowls, 1 pottery lamp, no cups, 1 stove, no incense burners, no figurines, 1 glazed piece. In addition: 2 bottles, 1 gasoline tin.

FIG. 66. Aymara figurines from Acora, Peru: *Left to right*, calf, bull, llama.

From the above, therefore, it will be apparent that not only is there marked range in the numbers of vessels owned; some representative Aymara families do not possess all of the native forms in current use. Again, all families, rich and poor, own some pieces not produced in the District of Chucuito.

Although, as has been shown, the manufacture of pottery is a masculine pursuit, pots are sold in the local markets of the Puno region by women. This pattern also appears to be general in Bolivia. La Barre writes "The women are the traders in pottery, as in all other wares offered at the periodic native markets."[102] The vessels are brought to the Sunday markets of Chucuito village packed in bales of *ichu* grass and transported on human back or by llamas or burros. The pots are carefully inspected by prospective customers, and are thumped and rung in order to discover hidden cracks. Trade continues to be conducted largely by barter, and an Indian desiring to purchase, say, an olla fills the vessel with barley, quinoa, or potatoes, and then gives this amount in exchange for the pot. According to a second system of exchange today common in Chucuito, the standard size pottery bowl is equated with one *čala* (a scant double-handful) of barley which, in turn, is evaluated in Peruvian currency at one *centavo* (approximately a sixth of a cent United States currency). In terms of this system, prices of other vessels averaged (in 1941) five *centavos* for a small olla, jug, basin, or toasting vessel, ten *centavos* for a large basin or olla, and up to fifty *centavos* for a chicha jar, depending upon its size.

[102] La Barre, 1948, p. 101. It is a general pattern of Aymara culture that women conduct local retail trade while men manage large-scale enterprises and make trading trips to distant regions (cf., Linné, 1925, p. 15).

## CONCLUSIONS

The development of Aymara ceramics in the Puno region has now been traced from the period immediately prior to the Inca conquest of the Titicaca Basin to the present day, a temporal span of at least five centuries. Viewing Aymara ceramics as a "pottery tradition" in Willey's sense, a striking stylistic continuity appears evident: techniques of grinding clay, kneading it, "souring" the paste, and methods of construction seem to have changed little, if at all; many vessel shapes have persisted; present-day paste, paints, and slips, as well as

some design motifs, represent an unbroken continuity from the past. It is not claimed that no modifications have occurred; the writer merely wishes to point out that, by and large, in this case persistence is far more striking than change. This observation seems of particular significance since it is a well-known archaeological platitude that pottery—the plastic art *par excellence*— is so sensitive to modification from generation to generation that it acts almost like a cultural barometer in reflecting change. Yet the Aymara ceramic tradition has been conspicuously insensitive and resistant to change throughout 500 years of drastic acculturation. If the data furnished by the Aymara ceramic tradition *taken alone and by itself* were our only evidence of change (which, of course, is not the case), the Inca era in the Puno region would have passed virtually unrecorded, and Spanish contact would have appeared to have been but slight and fleeting. By and large, Aymara ceramics have been modified to a far less extent than other, and more basic, aspects of Aymara culture.

The persistence of the Aymara ceramic tradition over a time span of five centuries should also serve as a warning to those archaeologists who are wont to identify anything less than very specific stylistic similarity (cultural form) with horizon (time). As Willey has observed, "attempts to use what are probably pottery traditions as style markers for specific time horizons has caused some misunderstanding in Peruvian archaeology."[103]

Other conclusions may be summarized as follows: From pre-Inca times to the present day the Aymara ceramic tradition has been characterized by an essential lack of differentiation between "ceremonial" and "utilitarian" wares, a trend also noted elsewhere in Peru for the Late period. This lack of stylistic distinction, however, in no way reflects a corresponding lack of elaboration in ceremonial life. Present day Aymara ritual is rich by South American Indian standards, and is known to have been far more complex in the past.

Pottery making among the Aymara appears to have been a masculine pursuit since pre-Hispanic times, and it is not at all unlikely that this pattern was widespread in ancient Peru. Failure to take this point into account may lead to errors in interpretation; thus, in building his case to demonstrate that the inhabitants of certain late Inca sites in Bolivia were in fact Inca *mitimaes* from Cuzco, Rydén bases his argument in large part on the incorrect assumption that the potters of Aymara territory were women.[104]

Narrow specialization and widespread trade characterize Aymara pottery manufacture at the present time, and there are many indications that these patterns hark back to the pre-Columbian past. Specialization and trade must account for the presence of sherds of such wares as Taraco Polychrome and the Sillustani types in pre-Incaic Chucuito, and probably explain in part the numerous Cuzco forms encountered in the Inca horizons of that town. In the case of the several Spanish-type wares and the Oriental ceramics of the Colonial era, specialization and trade are clearly indicated.

Finally, it must be pointed out that, in a certain sense, ceramic styles have been class-linked throughout the known span of Aymara history. Inca ceramics appear along with an Inca aristocracy and Inca political domination, and then disappear as Inca society disintegrates and Colonial society becomes consolidated. Aymara types continue to be made, and in quantity. In Colonial times glazed wares and several other forms of Spanish-influenced and foreign ceramics appear in Colonial horizons, and their presence coincides with the domination of an Aymara peasantry by a Spanish (and, later, Spanish-Mestizo) aristocracy. Aymara pottery persists in but slightly modified form. At the present time the Mestizo upper class employs commercially manufactured china and glass, while the Indians continue to use their native wares. Since class-structured society is known to be an ancient Andean pattern, the question of class-linked ceramic styles should receive serious consideration in the reconstruction of Peruvian prehistory.

[103] Willey, 1945, p. 53.

[104] Rydén, 1947, p. 323.

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# THE PETROGLYPHS OF DINWOODY, WYOMING

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IN 1873 the party of Capt. William A. Jones reported that "throughout the Wind River country of Wyoming many pictographs have been found, and others reported by the Shoshoni Indians."[1] Thus the Dinwoody petroglyphs and those in the surrounding area have been known for three-quarters of a century, and yet were not even surveyed for archaeological purposes until 1938 and 1939.[2] This, of course, is typical of the fate of petroglyphs over most of North America.[3] Only during the last twenty years has any attention been given by competent archaeologists to the subject of "Indian Writing."[4] There is no need to draw attention to the "interpretation" of these rock drawings by amateur speculators, for Steward's chastisement of them would be difficult to equal.[5]

The Dinwoody petroglyphs have not escaped this type of treatment. Many of the panels have been used to "prove" the existence of lost continents, buried treasures, and hidden cities. The real problem is not in the local myths, but in the actual physical defacement which seems to be the fate of historical and archaeological monuments in America. Fortunately, the Dinwoody petroglyphs are eight miles from the highway and are accessible only over a very rough and winding road; they have therefore been able to escape this type of destruction. Unfortunately, other sites in the state have not been so blessed with geographical obstacles, and therefore this defacement problem has made it imperative that work be done on a number of other sites throughout the state. The studies at Dinwoody are only a beginning to what it is hoped will be a complete study of Wyoming and the adjoining areas.[6]

The Dinwoody archaeological area is a rather ill-defined region at the head of Dinwoody Lake in western Wyoming. The lake can best be reached by following the dirt road which leaves U. S. Highway No. 287 about a quarter of a mile west of the Post Office station of Wilderness, Wyoming. The dirt road runs almost straight south till it reaches the lower end of Dinwoody Lake, where it turns southwest and ends at the head of the lake. The area itself is about a mile wide by two miles long and is centered around the prominent cliff which faces the lake on the north side and is known locally as the "Sleeping Ledge." The entire lake is in the lower part of Dinwoody Canyon; this is one of the main watersheds of the Dinwoody glaciers which are located on the eastern face of Gannet Peak on the continental divide. The canyon walls make up the north and south boundaries of the area; the east boundary is the lake; and the western boundary is the first of a series of steep hills which gradually lead up the canyon to the continental divide plateau. The entire area is on the westernmost boundary of the Shoshoni Indian Reservation and is about three miles east of the Washaki Wilderness National Forest line.

Dinwoody Canyon was ideal as a more or less permanent location for ancient Indian villages for several reasons. Most important is the fact that Dinwoody Creek provides a constant supply of pure water and a varied and abundant supply of fish throughout the whole year. Not far away is one of the largest forested regions of the western United States; even today it is regarded as one of the best game areas left in the country. Elk, deer, bear, and moun-

[1] Jones, 1875, p. 274.

[2] Wyoming Archaeological Survey, 1939.

[3] Steward, 1937.

[4] The major exceptions to this general condition are the two papers by Mallery (see bibliography).

[5] Steward, 1937.

[6] This paper is a report of field studies done by the authors during the summer of 1948, under the general sponsorship of the University of Wyoming. Without the help and interest of many people of Wyoming, we could not have undertaken the study. Also in a large measure our success in the field and elsewhere has been due to the kindness of many people who are too numerous to name here.

Our greatest thanks go to our actual field companion, Mr. Raymond Maret of the University of Wyoming who helped in many field matters as well as rendered invaluable assistance with technical photography. Also we wish to express our indebtedness to Mr. Bob David of Casper, Wyoming for his continued interest in the work and advice concerning conditions at Dinwoody and the like. To Mr. Bob White of Dubois, Wyoming goes our appreciation for his efforts as guide in the difficult country and for his hospitable actions before and during our stay at Dinwoody. Although many others too numerous to mention have contributed, special mention is due to the members of the Thermopolis Mineralogical Society for their assistance and interest in the many phases of the preparation for work in the field.

tain sheep and goat are common in the upper reaches of the valley. In the spring bear and mountain sheep are seen even down near the lower lakes. The valley is admirably protected during the winter and even during the coldest seasons the cliffs which face south are quite warm and protected from the winds. At the base of the cliffs people could winter in the large caves and move up the valley during the summer months to remain in a cool climate and follow the game.

Physically the valley lies between two cliff walls which vary from 200 to 300 feet at the eastern end to 1000 feet at the western end. The walls are composed of a reddish sandstone and limestone, and the formations exposed run from the Embar to the Chugwater. In the middle of the valley is a "hog-back" of Tensleep sandstone in whose walls are numerous caves and shelters. Most of the petroglyphs are found on the many smooth faces of these rocks. The average altitude of the area is 7100 feet, although there is a continuous upgrade to about 13,000 feet at the Gannet Peak Glacier Fields. The intervening country between the archaeological area and the glaciers is largely unexplored, and no detailed maps are available.

From a biological standpoint the Dinwoody Valley is a transitional zone between the short grass prairie climax community of the lower altitudes in Wyoming and the coniferous forest climax area characteristic of the higher places in the mountains below the tundra. The forested zone is confined to an altitude between 8,000 feet at Mud Lake to 11,000 feet on the plateau of the continental divide. As the entire area has been little disturbed by man even at the lower accessible altitudes, normal floral and faunal relations typical of the ecological types described actually exist.

Many of the sites of the archaeological area were trenched and excavated by the Wyoming Archaeological Survey during 1938 and 1939. This work was sponsored by the W. P. A. under the direction of Mr. Ted Sowers. The survey disclosed that the valley had been occupied for a long period of time and by many Indian groups. The main cave has been partially excavated and the camp site completely trenched with a yield of hundreds of potsherds and other artifacts.[7] Unfortunately, little or no attempt was made to establish even a relative stratigraphy for the artifacts with the result that there is now in existence a large collection of artifacts whose archaeological value has been almost completely destroyed. In our investigations we located at least two caves of large size and four possible camp sites which show signs of extensive occupation. These should be investigated and carefully excavated with a view to establishing the needed stratigraphy.

After a general study of the area we are convinced that we have photographed, studied, and analyzed nearly every petroglyph and that a reasonably complete record has been preserved for future study.

The method of attacking the problem of petroglyphs had to be faced as an entirely new question, for very little systematic work has been done on the subject in North America. There are, we realize, some notable exceptions to this: the excellent work of Steward in California[8] and the field work of E. B. Renaud in Colorado and New Mexico,[9] but for our particular area these studies could only be used as a basic framework.

It was decided before we actually approached the field work that we would first divide and give to each general area a letter, i.e., "A" for Dinwoody, "B" for Dry Creek, etc.; second, we would divide the groups of petroglyphs on a geographic basis into what we termed "sites"; for example PS1 at Dinwoody is an entire cliff separated at the right from PS11 by fallen talus and separated on the left from PS6 by a sloping hill covered with more talus. All petroglyphs on this particular site were subnumbered *1*, *2*, *3*, etc; therefore, the numbers of the individual sites and their subdivisions have no intrinsic value beyond the fact that they designate the manner and order in which they were found and recorded. In many instances we have a high number very near a lower one; this situation occurs because the higher numbered panel was not recorded on the first survey.

In writing the field notes a notation was made on the geographic features of the sites, i.e., the type of geologic formation, location, height, direction in relationship to lake etc. For the panels themselves, individual notes were taken describing weathering, pecking measurements, style of pecking, the particular rock upon which it occurred, and any unusual features of the panel, as the occurrence of "sun" symbols, zigzag lines, and abstract designs. Also at this

[7] Wyoming Archaeological Survey, 1939.

[8] Steward, 1930.

[9] Renaud, 1936.

time the panel was chalked in, and both a photograph and a drawing were made.

After a number of sites had been visited and superimpositions discovered, we were able to establish the several types. With them in mind a study was made of the drawings and the photographs, and the various figures were assigned to specific types. This could be done only for a limited number of panels and figures; those that we were unable to assign to appropriate categories from the field notes and pictures were revisited several times and compared with our superimpositions. Thus we were able to classify all the panels and the figures[10] appearing on them to one of four types.[11] Finally, a series of trips were made to all the sites to recheck those that we had originally classified and to check those that we had later assigned in the field. From this work we were able to make up our final distribution of sites.

Perhaps the most difficult task facing the investigator of new archaeological material is the problem of establishing the chronology of that material. Two types of chronology are recognized and usually the first must be established before it is possible to deal with the second. The first is the relative chronology; it is concerned with the age of the artifact (or petroglyph in this case) in relation to other artifacts from the same site or area. In the case of buried artifacts this information can usually be obtained by a study of the stratification in relation to other artifacts in a trash heap or cave floor. This process is called seriation, and results in a stratigraphic sequence of artifacts similar to the sequence of formations in geology. However, in establishing a relative chronology of petroglyphs, this procedure is inapplicable because of the fact the petroglyphs are not buried. Generally speaking, relative chronology can be more or less positively established by:

1. Actual superimpositions on the same surface where the figures show differences in weathering and/or differences in style.

2. General conditions of weathering on the same or like surfaces.

3. Changes in style from a realistic primitive to a more complex advanced style.

[10] Except for one, PS1, *11*.

[11] At the time of our second visit a detailed map was drawn of each site showing where each panel occurred in relationship to the other sites. Therefore, if any person wishes to visit or investigate any one of the sites, he should have little or no difficulty.

On the bases of these criteria we were able to divide the various panels at Dinwoody into four types. Type I, the oldest, was subdivided into Types IA and IB, and Type IV, the latest of the four types, was divided into Types IV and IV′. Type I is composed primarily of animal representations. Types II and III center their attention upon various human and abstract designs. Although Type IV is the last of the four types its human and animal designs are very simple in comparison to its predecessor.[12]

As far as is now known there are no examples in North America in which evolutionary stages from the pictographic to the phonetic can be seen. Actual superimpositions are apparently rare and have not previously been reported from Wyoming.[13] We recognize five superimpositions in a total of 97 panels; there are in addition six or more panels which, though not strictly superimpositions as defined in criterion No. 1 above, are close enough to be regarded as of definite value. These six panels are regarded as establishers of chronology because they all contain differences in weathering and style of figures on the same surface but not actually on top of each other.[14] The definite superimpositions show all the types and their subdivisions except Types IV and IV′.[15]

No serious attempt has been made to establish the absolute chronology at Dinwoody, or for that matter any of the sites in Wyoming. This second type of chronology is an attempt to assign actual dates to the artifacts and depends basically upon being able to equate the artifacts in question with other artifacts of the same culture or cultures which have already been dated.

A typical example of a superimposed panel is shown in Figures 67–71.[16] The panel is on a rock

[12] For a more complete description of the various types see pp. 224–5.

[13] Reynaud, 1936.

[14] The single example of a Type IV petroglyph on a chronology-establishing panel is in the case of PS1, *2*, which is unfortunately the least definite of the series of six. This leads us to mention that the evidence for a definite Type IV is the weakest we have, although it is still considered enough for us to give it the same rank in the statistical analysis given to any other type.

[15] A miscellaneous category for some doubtful panels. Type IV is found on one of the panels still regarded as of chronological value.

[16] This panel is on a small cliff above the larger cliff which makes the backdrop for the ancient camp site. The cliff upon which it occurs is not visible from the camp site but

FIG. 67. Type I A petroglyphs, Site PS2, *2*, Dinwoody, Wyoming.

which has two faces nearly at right angles to each other, each face containing part of the panel. The dimensions of this section are 6 feet high by 4 feet long. This panel shows typical figures of Types IA, IB, II, and III, and all are in a good state of preservation. This panel

FIG. 68. Type I B petroglyphs, Site PS2, *2*, Dinwoody, Wyoming.

in the field would serve to illustrate the point that superimpositions are not always obvious, as one can see only the Type III and one Type II figure upon first examination; but on continued study the Type I and the rest of the Type II figures gradually become apparent. The figures of this panel assigned to Type IB show two things of interest: most of the Type IB figures at Dinwoody are pecked all over like the typical Type IA. If it were not for the fact that there is a solid pecked front view of an animal head (Fig. 68) definitely superimposed on a Type IA animal, and that this face is more weathered than the lines of a Type II figure hidden by the

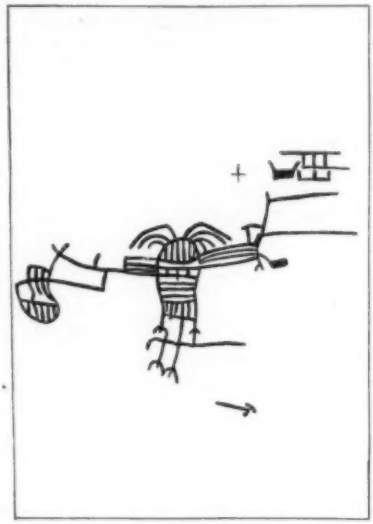

FIG. 69. Type II petroglyphs, Site PS2, *2*, Dinwoody, Wyoming.

large Type III figure which is superimposed on it in the lower right corner, we would be inclined to place the solid animal head in the Type IA and the others now called IB in Type II. The other Type IB animals are not solidly pecked but are as weathered as the head discussed and all show about the same degree of removal from the realistic animals of Type IA. Unfortunately, there are no other Type IB figures definitely superimposed on Type IA so that we could confirm our diagnosis of the subdivision of the category.

can be reached by climbing the camp site cliff and walking across several small ledges about 100 yards due north at the end near the lake.

FIG. 70. Type III petroglyphs, Site PS2, *2*, Dinwoody, Wyoming.

Judging from the types of animals represented (see below, p. 224), the people who made the Type IA and IB panels were probably nomadic hunters and may have followed the game into the high places in the mountains. A further interesting point is that the buffalo is never represented in the Type IA and IB panels while it is common in the petroglyphs of the Plains Indians.

Other definite chronology-establishing panels at Dinwoody show much the same kind of relationship as the one illustrated, and similar conclusions are to be drawn from them. The following notes give a brief description of each panel which shows definite superimposition:

1. Site PS3, *2*. This panel shows Types IA, IB, II, and III. Its dimensions are 5 feet 4 inches high by 5 feet 7 inches wide, and it is on a separate rock. All of the types are quite typical although the weathering is greater than at PS2, *2*.

2. Site PS5, *1*. This panel, whose dimensions are 2 feet 2 inches high by 6 feet 3 inches wide, was the first one in which we recognized superimposition. It is also the first one in which we recognized the difference between Type IA and IB. It shows two types, IA, IB, and III.

3. Site PS5, *2*. This panel is right next to PS5, *1* on the cliff facing the ancient camp site. Its dimensions are 5 feet 10 inches high by 5 feet 5 inches wide. There are a great number of figures in this particular panel. Types IA, IB, II, and III are seen in it.

4. Site PS8, *1*. This panel is the one which Mr. Ted Sowers has called "The Birth of the Twins" in his unpublished report in the University of Wyoming Library. It is made up of mostly Type III figures with a few Type II and one prominent Type IB animal which is probably a deer or an elk. The dimensions of the panel are 4 feet 2 inches high by 15 feet 9 inches wide, and it is located on a north-facing cliff on the south side of the lake. This is one of the largest and most complicated panels at Dinwoody but is rather far from the center of concentration and is one of the very few north-facing cliffs which have petroglyphs. It is almost directly across the lake from the "Sleeping Ledge."

The following list gives all the other panels which we regard as of chronology-establishing value but which are not superimpositions as the ones listed above. The types we recognize in each are also listed.

| | |
|---|---|
| 1. Site PS (S.L.) 11, *4* | Types II and III |
| 2. Site PS1, *2* | Types III and IV |
| 3. Site PS3, *3* | Types II and III |
| 4. Site PS5, *4* | Types IA and II |
| 5. Site PS5, *10* | Types IB and II |
| 6. Site PS6, *2* | Types II and III |

A statistical analysis brings out many features which might otherwise be overlooked by the casual observer. The fact that the types do fall into a narrow list or category exemplifies again the solidarity of the various types and that the division line between them is not merely arbitrary. There are 120 occurrences of the various types at Dinwoody. Of this number

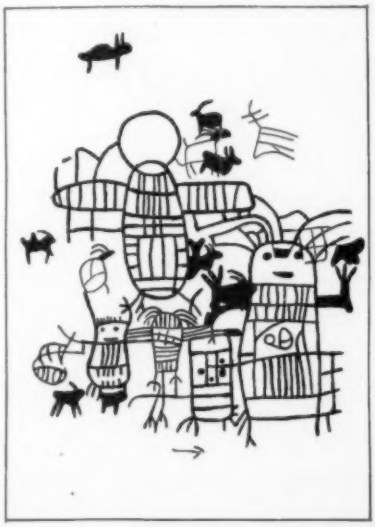

FIG. 71. Superimposition of the four types of petroglyphs, Site PS2, *2*, Dinwoody, Wyoming.

FIG. 72. Typical figures of Types I A and I B, Dinwoody, Wyoming. *a*, *b*, and *d* are from Site PS4, *3*; *c*, *h*, PS5, *3*; *e*, PS8, *1*; *f*, PS2, *2*; *g*, PS5, *2*.

Type IA is represented by 8 occurrences, Type IB by 9, Type II by 34, Type III by 58, and Types IV and IV′ by 11. Thus it will readily be seen that Type III predominates over all the other types.

The distribution of the types in relation to Dinwoody Lake presents an interesting pattern. Types IA, IB, and II occur mostly to the west of the lake, while 44 of the 58 occurrences of Type III were found north of the lake. Exactly one-half of the petroglyphs occur north of the lake; the rest occur on the west and south sides.[17]

Proceeding to a closer examination of the four types we discover that Types IA and IB represent almost entirely game animals (Fig. 72); in fact only one human representation was found in Type IA and nine in Type IB. In these two types the human form is usually represented by a cross, sometimes with a dot for a head. There are a few variations of this, as in PS3, *2* and PS5, *1*, where the arms on the figures have taken on the characteristics of wings. Compared to the large human and animal representations we find in Type III, the figures in Type I are miniatures. The human figures measure from 3 inches in PS5, *10* to 1¼ inches in PS5, *1;* the animals are in the same proportion, measuring from 8 inches in the case of PS8, *1* to 1¾ inches in an animal representation in PS5, *1*. The animals depicted in the early panels are, on the whole, still common in the area, or were so up to a few years ago.

The animals are difficult to identify because the characteristics of many are so nearly alike; the deer and the elk are similar, as are the mountain sheep and the mountain goat. We were able to make out six distinctly different animals, four of which appeared more than once. The most numerous were the mountain sheep and goats, which in both IA and IB occurred more often than all the other animals combined.

FIG. 73. Typical figures of Type II, Dinwoody, Wyoming. *a* is from Site PS3, *2*; *b*, PS5, *12*; *c*, PS4, *1*; *d*, PS6, *2*; *e*, PS6, *4*; *f*, PS1, *14*; *g*, PS5, *4*; *h*, SL4; *i*, PS5, *2*; *j*, PS3, *4*.

The majority of the human and animal representations in both types were solidly pecked[18] and in all cases the panels were close to the ground.[19]

[17] There are no rock faces or surfaces east of the lake and no drawings are found on any of the igneous rocks, which are scattered through the lower valley.

[18] All the animal and human representations of Type IA were solidly pecked while we have three examples of outline pecking in Types IB. The one human figure in Type IA occurs in PS5, *2*; the nine from Type IB occur in the following manner: two in PS3, *2*, three in PS5, *3*, and four in PS4, *2*.

[19] The one exception to this is PS6, *4* which occurs about 600 feet above the valley floor on a south-facing cliff.

When one begins to study Type II, he is immediately struck by the high degree of conventionalization that has been reached by these people in their drawings. We no longer find the great predominance of animals that was present in the two earlier types; the human figure has emerged as the center of attention (Fig. 73). The panels themselves are also much larger, measuring up to 7 feet wide by 6 feet high, and again, as in Type I, we usually find them near the ground. Abstract figures occur here for the first time.[20]

Type III appears to be a more advanced

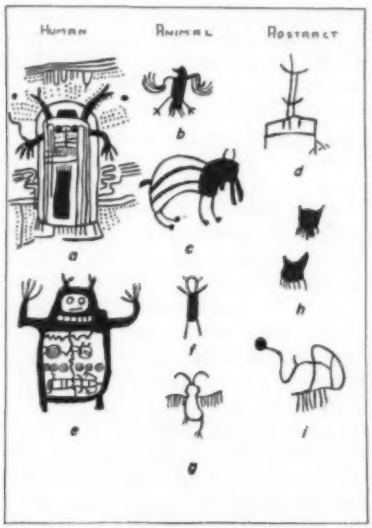


FIG. 74. Typical figures of Type III, Dinwoody, Wyoming. *a* is from Site SL7; *b*, PS10, *6*; *c*, PS6, *2*; *d*, PS10, *9*; *e*, PS8, *1*; *f*, SL7; *g*, PS1, *12*; *h*, SL3; *i*, SL15.

conventionalization of Type II, at least in style (Fig. 74). This type, as already mentioned, makes up almost half of the petroglyphs at Dinwoody, and it is in this type that we find our most imposing panels, measuring 38 feet long and 17 feet wide in the case of PS (S. L.) 11, *5*. The majority of these panels occur on the "Sleeping Ledge" north of the lake, and the main panels occur high above the ground level of the valley on smooth ledges. On the whole the figures of this type are deeply pecked

[20] Most likely a great percentage are conventionalized human forms, but it is impossible to so assign them with any certitude.

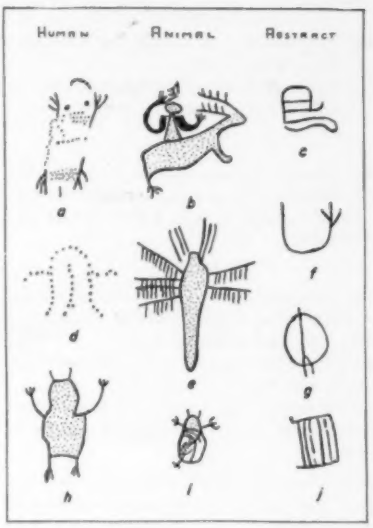


FIG. 75. Typical figures of Type IV, Dinwoody, Wyoming. *a*, *g*, *i* are from PS1, *2*; *b*, *c*, *h*, PS7, *1*; *d*, PS4, *11*; *e*, PS6, *5*; *f*, PS4, *12*; *j*, SL8.

and little weathered. Although upon first glance the drawings appear incised, upon close and careful examination it will be seen that they are pecked close together, the various peckings forming one thick line. In depth the pecking measures from $\frac{1}{4}$ inch in the case of PS (S.L.) 11, *3* to $\frac{1}{2}$ inch in PS (S.L.) 11, *9*. There are some indications of patination on some of the figures, and those of this type on the south side of the lake are entirely covered with orange lichens.[21] Another interesting feature of this period is that the figures are no longer equally proportioned. We have some figures in the same panel which are 10 inches and others 6 feet high.[22]

Type IV (Fig. 75) is without question the most composite of all types, and it is likewise open to the most doubt. The human figure is still the center of attention, but there is an increase in percentage of the number of animals depicted. The figures are on the whole lacking in the essential characteristics of Type III, although we do find some similarity, for example, three fingered hands and toes.

The following is a detailed breakdown of the types:

[21] PS8, *1*, *2*, *3*.

[22] These occur in PS (S.L.) 11, *4* and *5*.

TYPE IA

*Human.* There is only one human representation in this type, occurring at site PS5, *2*.

*Animal.* There are 30 animals: 4 mountain sheep, 1 elk, 5 deer, 2 antelope, and 8 which are questionable.

TYPE IB

*Human.* There are 9 representations scattered over 3 sites.

*Animal.* Seventy-eight animals: 40 mountain sheep, 2 elk, 12 deer, 2 antelope, 1 bear, 1 wolf, and 22 which are questionable.

TYPE II

*Human.* There are 62 human representations. Of this number 24 have wings, 20 three-toed feet, 19 horns, 2 genital organs, and 17 are solidly pecked.

*Animals.* There are 9 animal and insect representations; of this number 3 are identified as deer.

*Questionable and abstract.* There are 7 which appear complete in themselves and 20 which are classified as questionable.

TYPE III

*Human.* There are 155 representations. Of these 43 have wings, 93 three-toed feet, 96 fingered hands, 24 dots around the head or upper part of body; 37 are solidly pecked; 78 have horns, 19 snakes, and 9 genital organs.

*Animal.* Of the 20 representations, 9 are birds or insects, 4 of which are placed over the head of a human representation; the remaining 11 are animals, 4 of which are identifiable as dogs.

*Questionable and abstract.* Seventy-nine fall into this category; 50 of these are complete in themselves (of this number 9 are recognized sun symbols, the remaining 29 are questionable).

TYPE IV

*Human.* There are 14 representations; 7 have toed feet, 9 fingered hands; 3 are solidly pecked, 1 completely surrounded by a circle.

*Animal.* There are 3 representations; 1 is elk and 2 are birds or possibly insects.

*Questionable and abstract.* These are 8 in number, 7 of which are abstract, 1 questionable.

In a study of petroglyphs one is always impressed by the similarities to certain abstract or conventionalized signs found in all quarters of the world. It probably illustrates Dr. Renaud's remark[23] that primitive peoples evolve in much the same way, and that they use the same symbols to designate the natural objects surrounding them. The universality of the spiral has been commented on by almost every writer in the field, no matter where his studies have led him.

While the Wind River petroglyphs have a certain peculiarity of their own, they are still, in a broad sense, similar to others found all over North America; quite naturally they are close to those of California and the Southwest. The early human and animal representations of Types IA and IB appear to be most like those which are found over the whole continent. For instance, what appear at first glance to be perfect reproductions of the early panels at Dinwoody are found in the Lamar district of Colorado and in the "Lost City" (Pueblo Grande de Nevada) in southern Nevada.[24]

In dealing with Types II and III we do not encounter the universality found in the earlier types. With a few exceptions, the panels of Type III far surpass in complexity anything reported from the Southwest or from the Plains area.[25] The sun symbol (PS6, *2*), the rain sign (PS[S.L.]11, *7*), the cloud symbol (PS [S.L.] 11, *10*), the rain wings (PS[S.L.]11, *3*), the zigzag (PS10, *7*), the "Spirit Birds" (PS[S.L.]11, *5*) are all found throughout the Southwest and California areas.

An interesting similarity is found when we compare the painted petroglyphs of Desert Queen Well in southern California (Fig. 76, *A*) with the painted petroglyphs of the main cave at Dinwoody. Both apparently are human figures partially enclosed in a circle. There has been some speculation that the latter may represent the sex of the figures, but judgment on this should be suspended, if for no other reason than lack of evidence.

At this point, mention should be made of a small pendant that was recovered by the W.P.A. crew in 1938–39 (Fig. 76, *B*). Made of black soapstone, it was found 5 feet below the surface at the entrance to the main cave, and measures ¾ inch by 1½ inches. Some artifacts were associated with it, but to our despair they were not noted in detail, as no stratification was recorded. The pendant contains drawings incised on both faces of the stone; the workmanship is of a very good order. There is a human representation on each side, and both figures are accompanied by various abstract signs or decorations.

It is from artifacts of this kind that we hope to find the key to our absolute chronology. The fact that the early digging was not well conducted has removed this particular piece from the important position that it might well have assumed, and it also poses a series of new problems. Even assuming that we know what arti-

[23] Renaud, 1932, p. 34.

[24] Renaud, 1938, p. 55 and Pls. 16, 19, 24, and 26; Steward, 1930, pp. 189–203, Figs. 89 and 90.

[25] Morss, 1931.

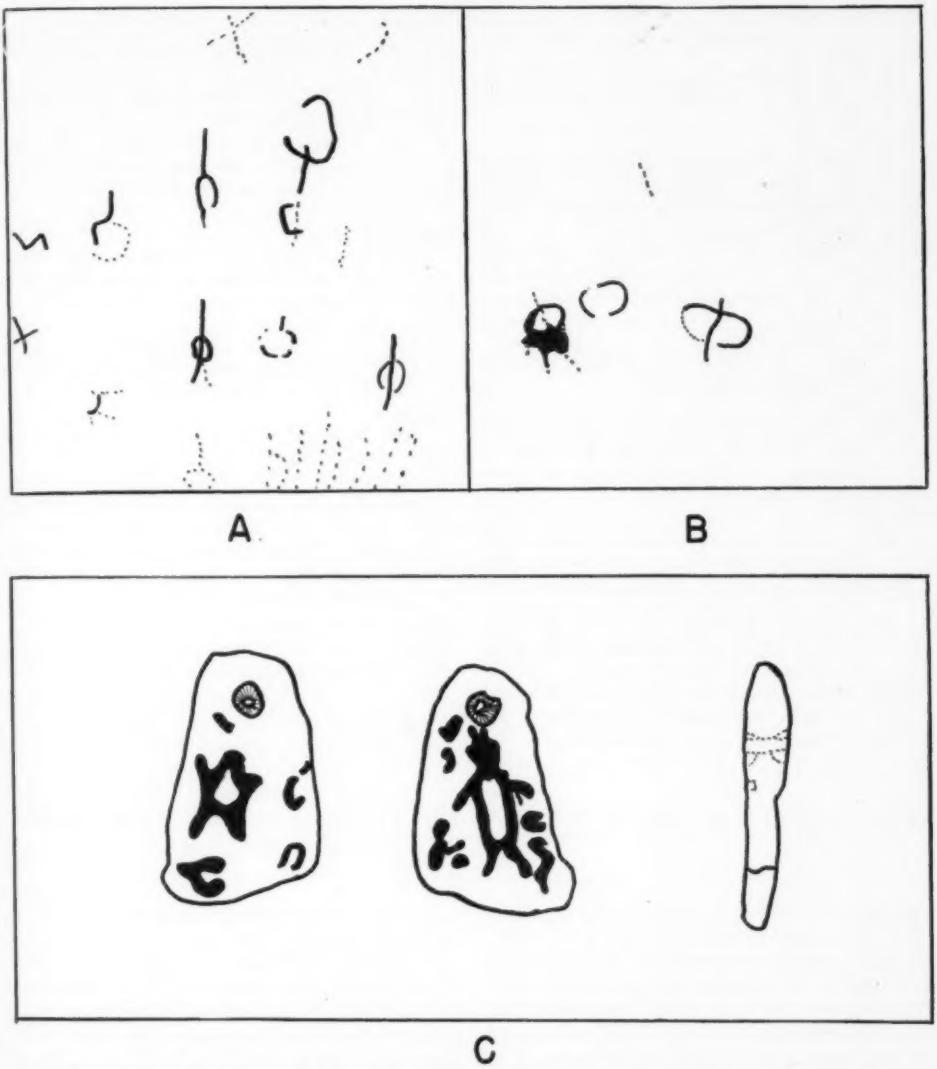


FIG. 76. *A*, petroglyphs from Desert Queen Well, southern California. *B*, petroglyphs from the main cave at Dinwoody, Wyoming. *C*, black soapstone necklace ornament found five feet beneath the surface in the main cave at Dinwoody.

facts were associated with it, and from what culture or phases they may have come, how are we to correlate it absolutely with our petroglyphs? We cannot judge from weathering or superimposition on the pendant; thus we are left to base our judgement solely upon style, a method which, at best, is open to question. The drawings on this particular piece are certainly different in style from Types IA, IB, and IV, but they are quite similar to Types II and III. We are inclined to believe they are more like Type III, but we realize that this judgment is not on an entirely objective basis.

As our studies broaden and include larger areas, we may be able to answer this and many other questions. We are both convinced that only by dealing with a larger area will our study produce the desired results.

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June, 1949

# STRATIGRAPHIC TESTS IN THE EVERGLADES NATIONAL PARK

JOHN M. GOGGIN

THE chronological picture in the Glades Area of southern Florida is based on the combined sequences for three subareas, Calusa, Okeechobee, and Tekesta (Goggin, 1947). The Tekesta sequence is perhaps most detailed, being the result of site seriation and of stratigraphic testing at Upper Matecumbe Key (Goggin and Sommer, 1949). Even in this subarea, however, further stratigraphic work is needed to fill out the picture.

An attempt was made to supply the necessary details during three days in January and February, 1949, when archaeological tests were conducted in the Everglades National Park, specifically on the headwaters of Shark River and in the Cape Sable area at the extreme southern tip of the state.[1] The National Park

[1] This was a joint project of the Department of Sociology and Anthropology, University of Florida, and the Everglades National Park. A grant made by the Viking Fund, Inc. to the former institution aided in the work, while the National Park Service furnished transportation, living quarters, and guide service. I am indebted to Dr. John Maclachlan, Head Professor of the Department of Sociology and Anthropology, University of Florida, for making it possible to leave the University between academic semesters for this project. The thorough and pleasant cooperation of the Park Service and particularly of Dan Beard, Superintendent of the Everglades National Park, is also acknowledged. I also wish gratefully to recognize the important help of the other party members who cheerfully resisted the superlative fishing attractions in the neighborhood for the hard and hot work of excavation. Helpful laboratory assistance was rendered by Mary Godwin, Lois Watkins, Robert Spangenberg, and Bernard Boyle. Illustrations were prepared by Robert Spangenberg.

Service was represented in this work by J. C. Harrington, Regional Archaeologist; Willard Dilley, Park Naturalist; and Paul Barnes, Ranger. Dr. John W. Goggin of Miami, Ripley Bullen of the Florida Park Service Archaeological Survey, and the writer made up the balance of the personnel.

Three sites were tested: Cane Patch and Rookery Mound on the Shark River, and site No. 1 near Bear Lake. These were chosen because it was believed that they would fill specific gaps in the chronological picture. It was planned also to work at Little Banana Patch, on the Shark River, but this was found to be too small and shallow to warrant testing.

Several months later, in April, two more days were spent making another test excavation. This was also at Bear Lake 1, but in another part of the site. Additional tests were planned for Bear Lake 2 and 3 but rain cut the work short.[2]

The status of chronological knowledge before the present work can be briefly summarized as follows. A broad cultural sequence had been constructed for South Florida, consisting of three major periods and several subdivisions, from early to late: Glades I, Glades IIa, IIb, Glades IIIa, IIIb, IIIc. In southeastern Florida (Tekesta subarea) the local sequence is as follows (with its broader temporal equivalent in parenthesis): Matecumbe Ia (Glades IIa), Matecumbe Ib (Glades IIb), Matecumbe IIa (Glades IIIa), Matecumbe IIb (Glades IIIb), and Matecumbe IIc (Glades IIIc).[3]

Matecumbe I is characterized ceramically by the Key Largo complex, a group of pottery types including Key Largo Incised, Miami Incised, and Matecumbe Incised. The first two appear in Ia times while the first and last type are characteristic of Period Ib. Matecumbe II is similarly distinguished by the Surfside complex, including Surfside Incised and Glades Tooled. The first is found in Period IIa, the second in IIb. The addition of European pottery and other materials to Glades Tooled marks Matecumbe IIc. These temporal units were all represented in the present work, as well as others not previously recognized.

## SITES

*Rookery Mound.* This is a low black dirt midden located on Rookery Branch, one of the headwater streams of Shark River, approximately 8 miles above Tarpon Bay.[4] Rookery Branch, a long mangrove-bordered finger stretching out into the Everglades, has undoubtedly been an important waterway for travel from the glades to the coast. Not far away in the Everglades proper are similar sites of the same age (Goggin, MS).

The site lies on the right bank of the creek, separated from the water by a rank growth of maiden cane. This mound is approximately 80 feet long on the major axis which lies 30 degrees west of north, and has a width of 35 to 40 feet. It rises a little more than 2 feet above the surrounding swamp. At the present time the site shows evidence of not too distant Seminole occupation, the heavy surface growth of sugar cane and a few citrus trees being reliable markers of their former presence.

Rookery Mound has been only recently known. It was first called to attention by Charles Brookfield who made a surface collection here in 1947.[5] No previous investigator has noted it, unless this is the site said by John K. Small (1924, p. 82) to be at the head of Shark River.

A test pit was made on the west, or far slope of the midden, slightly north of the middle of the site. It was 5 feet square and excavated in 6 inch levels. At an approximate depth of 17 inches cultural material disappeared in the gray marl. At a depth of 33 inches limestone was reached (below water level). The pit profile revealed, from top to bottom: 14 inches of black dirt and midden material, 3 inches of marl and small oyster shells, 4 inches of gray marl, and 9 inches of dark granular soil with fine crushed shell (freshwater species?).

Refuse was scattered through the black soil matrix, the only appreciable concentration being in the oyster shell zone at the bottom of the deposit. Shells were not abundant in the remainder of the material but they did form a small percentage of the total refuse. Marine

[2] Like the previous testing this was a joint project. Willard Dilley, Park Naturalist; Joseph Moore, Park Biologist; and other Park personnel assisted in the work. Several other volunteers also participated and their help is gratefully acknowledged.

[3] Goggin and Sommer (1949). Glades I was not positively known on the southeastern coast. A detailed summary of the archaeology of the Glades area as a whole is shortly forthcoming (Goggin, MS).

[4] This site is shown on a map in Brookfield and Griswold (1949).

[5] Material at Yale Peabody Museum, 142788–811.

forms present include *Busycon perversa*, *Ostrea* sp., *Venus* sp., *Arca ponderosa*, *Pinna* sp., and *Macrocallista nimbosa;* the fresh water varieties were *Ampullaria depressa*, *Planorbis* sp., and an unclassified mussel. Land forms were represented by *Euglandina* sp.

Animal bones were especially abundant, turtle being the commonest. In addition manatee (?), deer, and small mammal bones were found together with numerous fish remains, including the shark, drum fish (?), and unclassified forms. Alligator bones, bird bones, and crab claws made up the rest of the assemblage.

Cultural remains included 697 potsherds and 5 other artifacts, a respectable quantity from the small pit. The potsherds tended to be small, averaging little more than a square inch in size. Their typology and distribution by level is shown on Table 34. It will be seen that they are predominantly of the Surfside complex. The two major phases of Glades III times, the first characterized by Surfside Incised pottery and the second by Glades Tooled, can be clearly distinguished. The occurrence of two sherds of Key Largo Incised suggests a brief earlier occupation of the site.

The non-ceramic artifacts do not appear to have any significant distribution. From the first six inches came one crude limestone plummet-form pendant, a Macrocallista knife, and a Busycon pick A. In the second level a bone pin fragment and another Macrocallista knife were found. Nothing but potsherds was found in the third level.

Table 34. Ceramic Frequency, Test Pit, Rookery Mound*

| | *Glades Plain* | *Key Largo Incised* | *Surfside Incised* | *Glades Tooled* | *Unclassified Incised Gritty Ware* | *Biscayne Plain* | *European Majolica* | *Total by Rim and Body Sherds* | *Total* |
|---|---|---|---|---|---|---|---|---|---|
| 0"– 6" | 16 | 1 | | 22 | | 0 | 0 | 39 | 338 |
| | 297 | 0 | | 0 | | 1 | 1 | 299 | |
| 6"–12" | 43 | | 5 | 5 | 1 | | | 55 | 313 |
| | 257 | | 0 | 0 | 1 | | | 258 | |
| 12"–18" | 8 | 1 | 1 | | 0 | 0 | | 9 | 46 |
| | 35 | 0 | 0 | | 1 | 1 | | 37 | |
| Total | 67 | 2 | 6 | 27 | 1 | 0 | 0 | 103 | 697 |
| | 589 | 0 | 0 | 0 | 2 | 2 | 1 | 594 | |

* In Tables 34–37, the superior figure refers to the number of rim sherds, the lower to the body sherds.

We can interpret the history of the site, insofar as it is possible to do so from such a small test pit, as follows. It was first, very briefly occupied during Glades II times. There was a second occupation in Period IIIa, which may have continued more or less steadily into Glades IIb times, as denoted by the quantity of Glades Tooled pottery. The presence of a single majolica sherd suggests that the Glades IIIb occupation continued into historic times. This supposition is reinforced by surface material collected by Charles M. Brookfield, which included another majolica sherd and two fragments of Chinese porcelain dating from about the seventeenth century.[6]

*Bear Lake 1.*[7] This is the largest of a group of mounds which were marked for many years by a growth of large Royal Palms. These have been destroyed some time since 1938. The sites lie in a mangrove swamp several miles below the Coot Bay Ranger Station and north of the canal, which makes a pronounced jog to avoid them. Bear Lake lies to the southwest and Mud Lake to the north.

Bear Lake 1 is a long, narrow, curved or crescent shaped midden, measuring approximately 200 or more feet long, less than 50 feet wide, and rising steeply to a height of 8 or 10

[6] Specimens (Y.P.M. 142806–8) were kindly identified by Mrs. Kamer Aga-Oglu, Museum of Anthropology, University of Michigan (communication, November 30, 1948).

[7] This site was previously called Coot Bay Midden (Goggin, 1940), but for several reasons a change in nomenclature has seemed desirable.

feet. The surface is covered with a thick tropical hammock, one of the finest in South Florida. A few feet southeast is Bear Lake 2, a circular mound of marl, about 100 feet in diameter and perhaps 4 or 5 feet high. It may be a burial mound. Some 50 yards or so further to the southeast is Bear Lake 3, a small midden once measuring no more than 100 by 40 feet and about 2 feet high. The south edge of this site has been removed in digging the canal or else covered with spoil. About one-half mile east of the site this modern canal and road cross the bed of an aboriginal canal which extends for some distance to the southeast.

Despite the isolation of the site it has been known for a number of years, being mentioned especially in the writings of John K. Small, the noted Southeastern botanist (Small, 1924, p. 82; 1925, p. 278; 1929, pp. 103–6; 1931). A small test hole was made in Bear Lake 1 by the writer and his father, Dr. John W. Goggin, in 1938. Subsequently it was reported that Civilian Conservation Corp workers, on the wild cotton eradication project, dug here on Sundays and other holidays. The small trench in Bear Lake 2 and several small pits elsewhere can perhaps be attributed to them.

A spot on top of Bear Lake 1 about 50 feet from its western end was selected for our first test hole. This hole, 36 inches square, was carried down in 6-inch levels to a depth of 60 inches, i.e., through 10 level blocks. The short time available limited us to this small test, and it is regrettable that we were unable to reach the bottom of the site.

Midden material was scattered through the excavation, although it appeared to be somewhat concentrated in black zones or layers several inches thick. Between these the deposits were marl-like in nature. Refuse in general consisted of scattered shells, animal and fish bones, and broken artifacts.

No appreciable concentration of shells was noted. *Busycon* shell fragments were perhaps most abundant, with *Macrocallista* sp. shells next in frequency. Remains of *Liguus* sp., a large tree snail inhabiting the site, were found in the first two layers. *Euglandina* sp. shells, another land mollusc, were also found in these two levels. Other shells include *Cardium robustum, Venus* sp., *Arca ponderosa, Lucina jamaicensis, Ostrea* sp., *Melongena corona, Epitonium* sp., *Fasciolaria gigantea, Melampus coffeus,* a barnacle, and a fresh water mussel.

Animal remains were numerous, a few being saved from each level to indicate the general nature of the sample. Fish bones, spines, and vertebrae were particularly very common. Turtle bones were next in frequency, followed by bird bones. Mammal remains were not abundant, but deer and other bones were noted. Mouth plates from a ray were present. Crab claws, of more than one species (?), appeared in many levels.

A total of 990 potsherds and 22 other artifacts were found in the test hole. The sherds have been analyzed in terms of each level (Table 35). It will be noted that the potsherds found here are very small, averaging near or less than a square inch in size.

An examination of Table 35 indicates that distinct changes in ceramic styles took place. Certain of these can be noted. The lower four levels of our excavated section are distinguished by the Key Largo complex. Above these are three levels in which the bulk of the material is Glades Plain, a sole Surfside Incised sherd being suggestive of a possible intrusion. The final three levels have an important concentration of Surfside Incised.

The other artifacts found may be listed as follows (number of specimens in parenthesis):

*6–12 inches.* Hammerstone (?) (1).

*12–18 inches.* Bone pin (3), fish vertebrae beads (1), Strombus celt-hammer (1).

*18-24 inches.* Macrocallista knife (1), shell bead (1), shell billet (1), Busycon pick A (1).

*24–30 inches.* Macrocallista knife (2).

*30–36 inches.* Oliva bead (1).

*36–42 inches.* Macrocallista knife (1), thin grinding slab (1).

*42–48 inches.* Bone pin (1), thin grinding slab (2).

*48–54 inches.* Perforated shark's tooth (1).

*54–60 inches.* Small bone point (1), Busycon hammer C (1), unclassified stone object (1).

None shows any clustering except the Macrocallista knives. These are limited to the depths between 18 and 42 inches, a fact which suggests that they correlate more with the Key Largo complex than with the latter Surfside Incised pottery, although at the previous site, Rookery Mound, they were found with the Surfside complex.

In addition to analyzing the distribution of pottery types themselves certain ceramic traits or modes were examined, two in particular being especially considered. These are the use of incised broad arcs on vessel lips (Fig. 77, *E, J–L, V*) and the presence of crimped lips. The former trait appears on three pottery

TABLE 35. CERAMIC FREQUENCY, TEST PIT 1, BEAR LAKE 1

| | *Glades Plain* | *Key Largo Incised* | *Matecumbe Incised* | *Surfside Incised* | *Plantation Pinched* | *Unclassified Incised Gritty Ware* | *Biscayne Plain* | *Biscayne Check Stamped* | *Total by Rim and Body Sherds* | *Grand Total* |
|---|---|---|---|---|---|---|---|---|---|---|
| 0″– 6″ | 3 | | | 5 | | | 0 | | 8 | 25 |
| | 16 | | | 0 | | | 1 | | 17 | |
| 6″–12″ | 11 | | | 9 | | 1 | 0 | 0 | 21 | 97 |
| | 71 | | | 0 | | 1 | 1 | 3 | 76 | |
| 12″–18″ | 9 | | | 4 | | 0 | 0 | | 13 | 109 |
| | 93 | | | 0 | | 2 | 1 | | 96 | |
| 18″–24″ | 11 | | | | | 1 | | | 12 | 95 |
| | 83 | | | | | 0 | | | 83 | |
| 24″–30″ | 26 | | | 1 | 0 | | | | 27 | 137 |
| | 109 | | | 0 | 1 | | | | 110 | |
| 30″–36″ | 10 | | | | 1 | 0 | | | 11 | 55 |
| | 43 | | | | 0 | 1 | | | 44 | |
| 36″–42″ | 10 | 6 | 2 | | | 0 | | | 18 | 76 |
| | 55 | 0 | 0 | | | 3 | | | 58 | |
| 42″–48″ | 21 | 20 | 9 | | | 6 | | | 56 | 199 |
| | 118 | 0 | 0 | | | 25 | | | 143 | |
| 48″–54″ | 5 | 5 | 2 | | | 0 | | | 12 | 87 |
| | 73 | 0 | 0 | | | 2 | | | 75 | |
| 54″–60″ | 9 | 8 | 3 | | | 0 | | | 20 | 112 |
| | 90 | 0 | 0 | | | 2 | | | 92 | |
| Total | 115 | 39 | 16 | 19 | 1 | 8 | 0 | 0 | 198 | 992 |
| | 751 | 0 | 0 | 0 | 1 | 36 | 3 | 3 | 794 | |

types, Glades Plain, Key Largo Incised, and Matecumbe Incised, as well as on a single unclassified incised gritty ware specimen as follows:

| | *Glades Plain* | *Key Largo Incised* | *Matecumbe Incised* |
|---|---|---|---|
| 0″–36″ | 0 | 0 | 0 |
| 36″–42″ | 1 | 2 | 1 |
| 42″–48″ | 6 | 3 | 7 |
| 48″–54″ | 2 | 2 | 2 |
| 54″–60″ | 0 | 1 | 0 |

It will be noted that it is most abundant in the three levels between 36 and 54 inches. In the bottom level, 54–60 inches, there is a marked decrease in the frequency of the trait, only one example being found.

Crimped lips occur on Glades Plain pottery and, infrequently, on Key Largo Incised, as follows:

| | *Glades Plain* | *Key Largo Incised* |
|---|---|---|
| 0″–12″ | 0 | 0 |
| 12″–18″ | 1 | 0 |
| 18″–24″ | 0 | 0 |
| 24″–30″ | 2 | 0 |
| 30″–36″ | 1 | 0 |
| 36″–42″ | 3 | 0 |
| 42″–48″ | 1 | 1 |
| 48″–54″ | 0 | 1 |
| 54″–60″ | 0 | 0 |

The distribution of this trait does not appear to be sharply confined to any particular level except for its absence in the earliest and the two latest levels.

TABLE 36. CERAMIC FREQUENCY, TEST PIT 2, BEAR LAKE 1

| | Glades Plain | Goodland Plain | Goodland Red | Biscayne Plain | Unclassified Punctated Gritty Ware | Fort Drum Incised | Opa Locka Incised | Biscayne Red | Miami Incised | Key Largo Incised | Matecumbe Incised | Unclassified Incised Gritty Ware | Glades Red | Total by Rim and Body Sherds | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0"– 6" | 83 | 0 | | | | | | | | 41 | 7 | 24 | 0 | 155 | 955 |
| | 769 | 1 | | | | | | | | 0 | 0 | 28 | 2 | 800 | |
| 6"–12" | 61 | 0 | | | | | | | | 81 | 3 | 5 | | 150 | 819 |
| | 625 | 3 | | | | | | | | 3 | 0 | 38 | | 669 | |
| 12"–18" | 32 | | | | | | 4 | | 1 | 19 | | 0 | | 56 | 463 |
| | 394 | | | | | | 0 | | 0 | 0 | | 13 | | 407 | |
| 18"–24" | 16 | | 1 | | | | 5 | 1 | | 8 | | 0 | | 31 | 232 |
| | 196 | | 0 | | | | 0 | 2 | | 0 | | 3 | | 201 | |
| 24"–30" | 8 | 0 | 0 | 0 | 0 | 2 | 2 | | | | | | | 12 | 68 |
| | 52 | 1 | 1 | 1 | 1 | 0 | 0 | | | | | | | 56 | |
| 30"–36" | 5 | 3 | | 0 | | 1 | | | | | | | | 9 | 98 |
| | 54 | 34 | | 1 | | 0 | | | | | | | | 89 | |
| 36"–42" | 8 | 3 | 0 | 0 | | | | | | | | | | 11 | 77 |
| | 40 | 23 | 2 | 1 | | | | | | | | | | 66 | |
| 42"–48" | 4 | 1 | | | 1 | 2 | | | | | | | | 8 | 47 |
| | 36 | 3 | | | 0 | 0 | | | | | | | | 39 | |
| 48"–54" | 0 | 0 | | | | | | | | | | | | 0 | 13 |
| | 10 | 3 | | | | | | | | | | | | 13 | |
| 54"–60" | 0 | 0 | | | | | | | | | | | | 0 | 0 |
| | 0 | 0 | | | | | | | | | | | | 0 | |
| 60"–66" | 0 | 1 | | | | | | | | | | | | 1 | 2 |
| | 1 | 0 | | | | | | | | | | | | 1 | |
| Total | 218 | 8 | 1 | 0 | 1 | 4 | 11 | 1 | 1 | 149 | 10 | 29 | 0 | 433 | 2774 |
| | 2177 | 68 | 3 | 3 | 1 | 0 | 0 | 2 | 0 | 3 | 0 | 82 | 2 | 2341 | |

In general the ceramic sequence found in Test 1 at Bear Lake 1, is similar to that previously established for the subarea as a whole. The four lowest levels clearly equate with Matecumbe Ib while the top three levels are equivalent to Matecumbe IIa. The three intermediate levels represent a new horizon whose placement will be discussed in the conclusions.

Test Pit 2 (dug on the second trip) was made about 40 feet from the eastern end. It was planned that this pit should reach the bottom of the site and, furthermore, it was spaced at the other end of the site in order to detect any horizontal movement during the history of the site—this being a common phenomenon in South Florida.

The test pit was placed in the top of the site, laid out at an angle somewhat diagonal to the axis of the ridge in order to take advantage of space between trees. The size of the excavation at the surface was 4 by 7 feet, but at the bottom, due to soft sides and projecting roots, it was several inches smaller in each dimension. The unusual dry weather which enabled us to

work so late in the season also resulted in a very dry soil condition which made work difficult because of dust and, in addition, raised the problem of material falling from the sides. However, great care was taken to avoid mixture due to this last hazard.

Ten level blocks were excavated, in 6-inch levels to a total depth of 60 inches. In addition small shallow refuse pockets extending several inches deeper in the basal marl were cleared out. These are included as the 60–66 inch level, although only the pockets were excavated.

The refuse, similar in nature to Test 1, extended uniformly to 42 inches; from there to about 54 inches it was intermingled with marl. Below that point pure marl was dominant with pockets of refuse extending to about 64 inches.

The marl is unusual in that its history is not immediately apparent, but it was apparently either naturally or artificially reworked since it contains an abundance of both marine shells, *Epitonium* sp., as well as the land snail, *Polygyra* (two species). A line, run by hand level, indicates this marl (at the 60 inch level) to be 5 feet above the surrounding swamp. Presumably this marl rise was the foundation upon which refuse was first deposited to form the present site. Unfortunately, time was too limited to permit further digging in order to determine whether this marl was a natural or artificial rise, although the former is more probable.

Faunal remains are similar to those in Test 1. However, turtle bones increase in great frequency from the seventh level to the bottom. They are mainly, if not all, those of large marine species.

Artifacts included 2774 potsherds and 49 other specimens. The distribution of the sherds is shown in Table 36. As in the other sites the sherds are not large.

Surprisingly this pit has a completely different ceramic and cultural history from the other test. The top four levels contain material of the Key Largo complex, the first two dating from Matecumbe Ib (Glades IIb) times and the second two from Matecumbe Ia (Glades IIa) times. The following level (24-30 inches) represents a little known horizon which apparently can be equated with early Matecumbe Ia. The balance of the site (levels 30–66 inches) is characterized almost completely by plain pottery. The usually dominant Glades Plain pottery shares its position with Goodland Plain, which reaches its greatest frequency in the 30–42 inch levels. The Fort Drum Incised sherds in the 30–36 inch level probably belong to the following Matecumbe Ia times and are present here because of poor mechanical separation. The sherds from the 42–48 inch level classified as Fort Drum Incised, are anomalies, perhaps an accidental intrusion. One, with the expanded lip (Fig. 77, *A*), is not typical in paste to other types of the level; the other is also atypical. In contrast the deep punctated sherd from that level (Fig. 78, *U*) is similar in paste to Glades Plain of that level. The conclusion can be drawn that the lower part of this pit, from 30 to 66 inches, is Glades I in time.

The other artifacts found do not show any significant stratigraphic clustering, although the Busycon pick A is perhaps most common in the top of the pit. The artifacts are as follows:

*0–6 inches*. Busycon pick A (3), fish vertebrae beads (9), stone pendant (1).

*6–12 inches*. Busycon pick A (1), Busycon hammer C (?), pumice smoother (1).

*12–18 inches*. Busycon pick A (3), Busycon tool fragments (2), fish vertebrae beads (1), smoothing stones (?) (2), Oliva bead (1), short bone point (1), bone pin fragment (1).

*18–24 inches*. Busycon pick A (1), bone pin fragment (1), perforated animal bone (1), grooved bone pendant (1).

*24–30 inches*. Fish vertebrae beads (1), bone pin fragment (3), fractured shell tip (1), Strombus celt (1), Strombus celt blank (1), long bone point (1).

*30–36 inches*. Busycon pick A (1), grooved bone pendant (1), carved marl object (1).

*36–42 inches*. Fish vertebrae beads (1), worked bone (1).

*42–48 inches*. Pumice ball (1), Strombus celt (1).

*54–60 inches*. Stone hone (1), Busycon pounder (1).

An analysis was also made for the ceramic traits of incised arcs on the lip and for crimped lips. One sherd of Key Largo Incised from the first level bore an incised arc on the lip. Crimped lips were more common, four occurring in the first level and three in the second, in all instances only on Glades Plain.

Comparing Test 1 with Test 2 it appears that the lowest level reached in the first pit is equivalent in time to the top level in Test 2. In each case a single Key Largo Incised sherd with an incised arc on the lip was found. In the first test this trait increases above the bottom for the next three levels; in the second test it is absent in the remainder of the site.

The two tests offer us sufficient data to make an interpretation of the history of the site. It was probably started in Glades I times on a high marl outcropping in the vicinity of Test

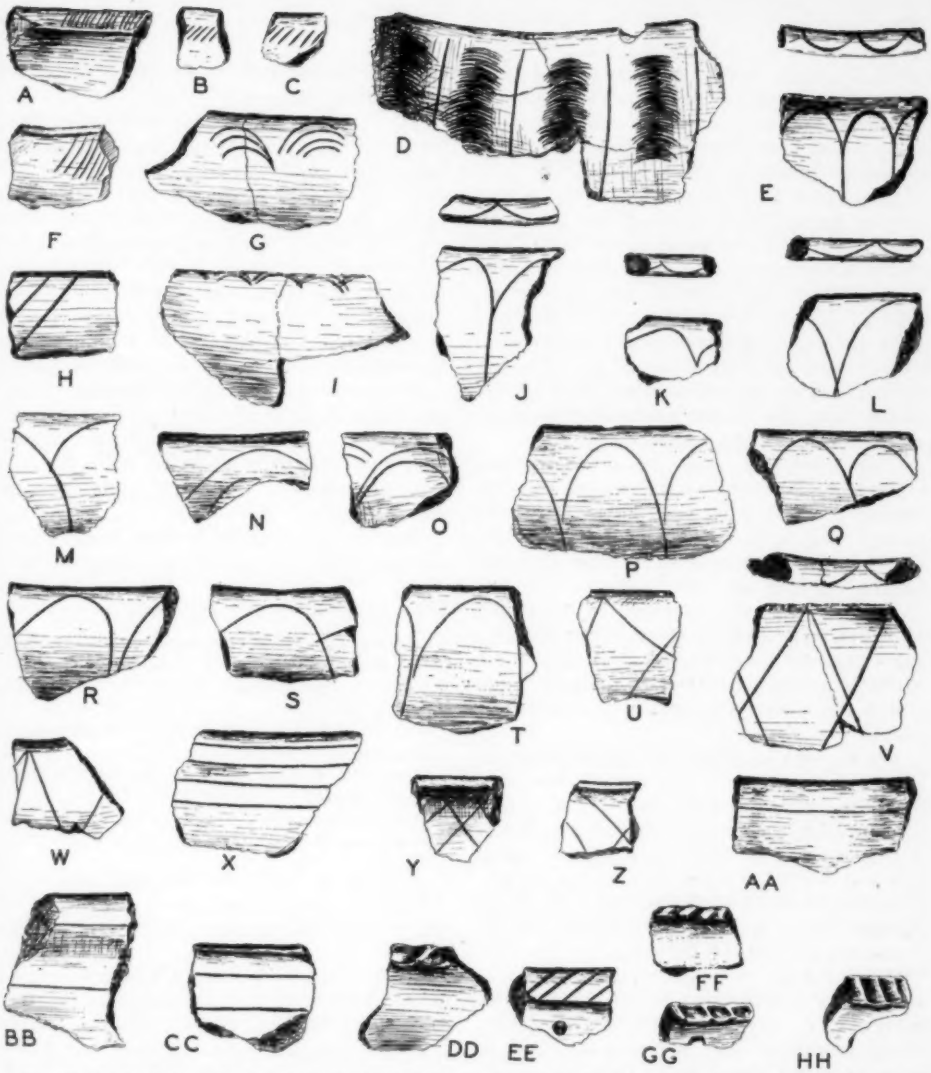


FIG. 77. Potsherds from the Everglades National Park: Drawings of the lips of some are shown above the sherd, to illustrate lip incision. *A*, Fort Drum Incised, Bear Lake 1, Test 2, 42″–48″; *B*, Fort Drum Incised, Bear Lake 1, Test 2, 24″–30″; *C*, Fort Drum Incised, Bear Lake 1, Test 2, 24″–30″; *D*, Opa Locka Incised, Bear Lake 1, Test 2, 12″–18″; *E*, Key Largo Incised, Cane Patch, 6″–12″; *F*, Miami Incised, Cane Patch, 24″–30″; *G*, Opa Locka Incised, Cane Patch, 24″–30″; *H*, Miami Incised, Bear Lake 1, Test 2, 12″–18″; *I*, Opa Locka Incised, Bear Lake 1, Test 2, 18″–24″; *J*, Key Largo Incised, Bear Lake 1, Test 1, 48″–54″; *K*, Key Largo Incised, Cane Patch, 6″–12″; *L*, Key Largo Incised, Bear Lake 1, Test 1, 42″–48″; *M*, Key Largo Incised, Cane Patch, 0″–6″; *N*, Key Largo Incised (variant), Cane Patch, 12″–18″; *O*, Key Largo Incised (variant), Bear Lake 1, Test 2, 12″–18″; *P*, Key Largo Incised, Bear Lake 1, Test 2, 18″–24″; *Q*, Key Largo Incised, Bear Lake 1, Test 2, 6″–12″; *R*, Key Largo Incised, Bear Lake 1, Test 2, 0″–6″; *S*, Key Largo Incised, Cane Patch, 24″–30″; *T*, Key Largo Incised, Bear Lake 1, Test 2, 0″–6″; *U*, Matecumbe Incised, Bear Lake 1, Test 2, 6″–12″; *V*, Matecumbe Incised, Bear Lake 1, Test 1, 42″–48″; *W*, Matecumbe Incised, Bear Lake 1, Test 2, 0″–6″; *X*, Surfside Incised, Bear Lake 1, Test 1, 12″–18″; *Y*, Matecumbe Incised, Bear Lake 1, Test 1, 54″–60″; *Z*, Matecumbe Incised, Bear Lake 1, Test 2, 6″–12″; *AA*, Surfside Incised, Rookery Mound, 6″–12″; *BB*, Surfside Incised, Bear Lake 1, Test 1, 0″–6″; *CC*, Surfside Incised, Rookery Mound, 6″–12″; *DD*, Glades Tooled, Rookery Mound, 0″–6″; *EE*, Glades Tooled, Rookery Mound, 0″–6″, *FF*, Glades Tooled, Rookery Mound, 0″–6″; *GG*, Glades Tooled, Rookery Mound, 0″–6″; *HH*, Glades Tooled Rookery Mound, 0″–6″.

Pit 2. Through time the inhabitants laid down their refuse forming a deep deposit which gradually extended westward. The earliest part of the site was then abandoned while the western end accumulated.

*Cane Patch.* This is another black dirt midden located on the headwaters of Shark River, specifically at the east end of Avocado Creek about three miles from Tarpon Bay. Opposite the site, which is on the north bank of the stream, Avocado Creek widens into a small bay and then opens up to the eastward as a wider stream called the South Prong of Shark River. Directly to the east of the site another small stream enters from the north, connecting with the North Prong of Shark River.

Cane Patch is a small mound of black soil rising some 3 to 4 feet above the surrounding swamp. Its exact outline and size were difficult to determine because of the heavy vegetation, but it appeared to measure no more than 100 feet on the long axis, which is parallel to the stream and roughly oriented northeast and southwest. The width is 40 to 50 feet. Surface vegetation is apparently the result of modern Seminole occupation; these are a large avocado tree, a thick sugar cane patch, and numerous banana plants.

The site has long been known to fishermen in the area because of the avocado tree, and it was noted by John K. Small (1924, p. 82), who mentioned this tree. On the U.S.C.G.S. Topographic Sheet T4459 it is called a "cultivated knoll." Like other sites on the stream, it was first brought to archaeological attention through the surface collecting of Charles M. Brookfield (Y.P.M. 142721–767).

Our excavation was made about 10 feet southwest of the avocado tree. It was started with a size of 42 by 42 inches, but by the time three 6-inch levels had been removed it had been constricted to a size of 36 by 36 inches. In all, eight levels were excavated. However, the water table was reached in the seventh (36–42 inches), and by the next one (42–48 inches) water interfered to such an extent that the level was not completely removed, Probing below this depth indicated that refuse extended to a depth of some 60 or more inches.

Refuse appeared throughout all levels, although in no particular concentration. There were artifacts, animal bones, and shells, constituting in all less than 10 per cent of the deposit, the remainder being a granular black dirt. In the lowest levels of the site marl became increasingly more important as a soil component.

The most numerous shells were the *Busycon*, probably *B. perversa*, *Ostrea* sp., and *Venus* sp. Less commonly found were *Conus* sp., *Fasciolaria gigantea*, *Fasciolaria tulipa*, *Melongena corona*, *Lucina* sp., and *Macrocallista* sp., probably *M. nimbosa*, as well as *Ampullaria depressa*, a freshwater gastropod. Animal remains were frequent, the forms represented including an unidentified fish, drum fish (?), turtle (marine as well as land forms), alligator, sting ray, deer, unidentified small mammals, and crab claws.

Potsherds were especially common in our test hole, a total of 2,455 specimens being found. It should be noted, though, that almost half were in the first six inches while the last, although not completely dug, contained only six sherds (Table 37).

Only 21 other artifacts were found. Since they are so few in number and so sporadically distributed they will not be tabulated but instead can be presented as follows:

*0–6 inches.* Glass bead (1), fish vertebrae beads (2), single groove columella pendant (1), limestone plummet-form pendant (1), short socketed bone point (2), perforated Spondylus shell (1).

*6–12 inches.* Busycon pick A (1), columella awl (1), worked sting ray spine (1).

*12–18 inches.* Busycon pick A (2), Busycon dipper (1), Fasciolaria hammer fragment (?) (1).

*24–30 inches.* Bone pin fragment (1), Busycon celt (1).

*36–42 inches.* Shell disk beads (4).

A study of Table 37 indicates interesting changes in ceramic frequency. Judging from the presence of ceramic material of both the Surfside and Key Largo complexes, the first level (0–6 inches) is clearly a mixed horizon occupied during both Matecumbe Ib, IIa, and IIb (Glades IIb, IIIa, IIIb) times. It is possible that this occupation also extended into Matecumbe IIc times (Glades IIIc); the glass bead previously mentioned may be early Spanish, and thus date from Matecumbe IIc, or it may be modern Seminole. Typologically, it is not distinctive of either period.

The next two levels (6–18 inches), and perhaps the third (18–24), are unmixed deposits of the Matecumbe Ib (Glades IIb) horizon. The following level (24–30 inches) apparently represents a brief Matecumbe Ia (Glades IIa) occupation. The exact significance of the bottom three levels (30–48 inches) is not too clear. The unclassified incised sherds recorded for levels 30–36 inches and 36–42 inches are per-

TABLE 37. CERAMIC FREQUENCY, TEST PIT, CANE PATCH

| | *Glades Plain* | *Unclassified Incised Gritty Ware* | *Fort Drum Incised* | *Cane Patch Incised* | *Key Largo Incised* | *Miami Incised* | *Opa Locka Incised* | *Matecumbe Incised* | *Surfside Incised* | *Glades Tooled* | *Biscayne Check Stamped* | *Total by Rim and Body Sherds* | *Grand Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0″– 6″ | 96 | 0 | | | 95 | | | 16 | 11 | 12 | 0 | 230 | 1200 |
| | 902 | 67 | | | 0 | | | 0 | 0 | 0 | 1 | 970 | |
| 6″–12″ | 19 | 1 | | | 27 | | | 8 | | | | 55 | 320 |
| | 242 | 23 | | | 0 | | | 0 | | | | 265 | |
| 12″–18″ | 29 | 0 | | | 16 | | | 5 | | | | 50 | 293 |
| | 234 | 9 | | | 0 | | | 0 | | | | 243 | |
| 18″–24″ | 12 | 0 | | | 9 | | | 1? | | | | 22 | 222 |
| | 192 | 8 | | | 0 | | | 0 | | | | 200 | |
| 24″–30″ | 31 | 1 | | | 4 | 1 | 6 | | | | | 43 | 325 |
| | 276 | 6 | | | 0 | 0 | 0 | | | | | 282 | |
| 30″–36″ | 4 | 0 | | | | | | | | | | 4 | 68 |
| | 63 | 1 | | | | | | | | | | 64 | |
| 36″–42″ | 4 | 0 | 1 | 0 | | | | | | | | 5 | 41 |
| | 34 | 1 | 0 | 1 | | | | | | | | 36 | |
| 42″–48″ | 0 | | | | | | | | | | | 0 | 6 |
| | 6 | | | | | | | | | | | 6 | |
| Total | | | | | | | | | | | | | 2475 |

haps Miami Incised, although very fragmentary, a fact which suggests that these levels, together with the 24–30 inch level, all form an expression of Matecumbe Ia. However, it is also possible that the lowest levels represent the Glades I period, a horizon not positively recorded elsewhere in this subarea. The presence of Fort Drum Incised and Cane Patch Incised sherds in the next to bottom level is not immediately explainable if these levels are dated as Glades I.

The distribution of non-ceramic artifacts is so sporadic as to be of little value chronologically. However, the presence of shell beads in the early levels of the site is of considerable interest since they are rare even in the better-known later horizons throughout the Glades Area.

As at Bear Lake 1, an analysis was made here of the distribution of incised arcs on vessel lips and of crimped lips. The incised arcs appear only in the very latest part of Matecumbe Ib times, namely in the top two levels, 0–12 inches, where they occur on Glades Plain, Key Largo Incised, and Matecumbe Incised types as follows:

| | *Glades Plain* | *Key Largo Incised* | *Matecumbe Incised* |
|---|---|---|---|
| 0″–6″ | 10 | 17 | 2 |
| 6″–12″ | 3 | 3 | 2 |
| 12″–48″ | 0 | 0 | 0 |

Crimped lips also occur only in those levels, appearing on the three above mentioned types but most commonly on Key Largo Incised:

| | *Glades Plain* | *Key Largo Incised* | *Matecumbe Incised* |
|---|---|---|---|
| 0″–6″ | 2 | 13 | 0 |
| 6″–12″ | 1 | 0 | 1 |
| 12″–48″ | 0 | 0 | 0 |

In summary we can note that Matecumbe IIa and IIb are represented by brief occupations on the very top of the midden. A Matecumbe Ib occupation is found throughout almost half of

the excavated part of the site, while Matecumbe Ia is only briefly represented. There was a possible occupation during Glades I times, but the sample is not large enough to draw a definite conclusion. In general this picture corroborates the sequence already proposed, except that possible questions about the cultural content of Glades I are raised. These will be discussed in the final conclusions.

## ARTIFACTS

### POTTERY

Potsherds were by far the most abundant of all artifacts found, occurring in every level of each site. With few exceptions (the Goodland forms, Biscayne forms, and 1 majolica fragment), all sherds are types of the Glades series, a quartz sand-tempered ware widespread in South Florida (Goggin, 1939). The basic ware and paste is found throughout the whole range of occupation represented in the Glades Area and in our excavations. Several decorated forms appear, run their life span, and disappear in that time, but the plain ware form, Glades Plain, is found throughout all periods. Nevertheless, it, too, undergoes considerable change throughout time, both in vessel and rim forms, as well as in general technical perfection as represented by vessel thickness, surface finish, and paste hardness. This technical development, either for better or worse, is more or less the same for all types of any period. Perhaps its peak is reached during the latter part of Glades IIb and in IIIa times.[8] Pottery both before and after these periods is poorer in execution and in paste, and is considerably thicker.

In addition to the variances mentioned, certain decorative traits appear to be unrelated to any particular type, occurring instead, during certain periods, on most types. One of these is the trait of incising broad arcs on vessel lips, which appears to be limited to the last half of Glades IIb.[9] Another is the crimping of vessel lips. Although data are not as equally conclusive, this also appears to be most characteristic of late Glades IIb times. However, its later sporadic occurrence reduces the value of the trait as a general temporal diagnostic, although when applied to types of the Key Largo complex it is of specific value.

The following pottery types will be briefly described with emphasis on any characteristics peculiar to the sites excavated.

*Glades Plain.* First described as a ware (Goggin, 1939) and later as a type (Goggin, 1944*a*), this form exhibits most of its known variations in the sample from the three sites. A detailed analysis of rim form and vessel shape would be valuable as a future project. For the present it can be noted that the early rims at Bear Lake 1, Test 2, are thick with rounded lips. Somewhat later material, early Matecumbe Ia, has either a flat or a thin papered lip. The lip again becomes fuller and rounder through time, and in Glades IIb begins to be built up, finally reaching a distinctive thickening in Glades IIIa times.

Vessel forms also change from simple open bowls in Glades I to bowls with incurved rims in the Glades IIb levels. In Glades IIIb, shouldered or carinated bowls are very typical. As has been mentioned in the general discussion of the Glades series, paste varies greatly, reaching its perfection in late Glades IIb and IIIa, when there is an occurrence of narrow tooling marks on the outside of the vessel.

The temporal range of the type is from Glades I through Glades III.

*Glades Red.* This is a type similar to Glades Plain but bearing red paint on either the inner, outer, or both surfaces of the vessel. It occurs sporadically over the Glades Area through most of the time of pottery making. It was represented at Bear Lake 1 by two sherds in a Glades IIb level.

*Glades Tooled.* This is a plain type characterized by a flattened lip, modified by pinching or deep diagonal grooves (Goggin, MS). No unusual forms appear in the present collections (Fig. 77, *EE–HH*). The temporal range of the type is Glades IIIb and IIIc.

*Surfside Incised.* Two, or in rare cases, one, three, or four incised lines around the vessel rim (Fig. 77, *X*, *AA–CC*) characterize this type (Goggin, 1944*a*, Fig. 2, *a–c*). Occasionally, triangular rim lugs are present (Fig. 78, *G*). These are decorated with simple incised-line decoration, perhaps with a few punctates, on top of the lug, in addition to the usual rim lines, which continue onto the underside of the lug.

It is during the life span of this type, in Glades IIIa times, that the technical perfection

[8] The artifacts are discussed in terms of the broader Glades sequence. See the comparison of this with the local Matecumbe sequence in an earlier section.

[9] At Upper Matecumbe this trait appears rarely on Surfside Incised (Goggin and Sommer, 1949). This gives it a somewhat later range than is found here.

of the basic ware is reached, an honor shared with contemporary Glades Plain examples. Also shared by the two types at this time are surface tooling and very shallow longitudinal or slightly diagonal lip grooves.

*Plantation Pinched.* This new type will be briefly noted here and described in more detail in a forthcoming paper (Groggin, MS). For some time the type has been found sporadically (Goggin, 1944*b*, Fig. 2, *h;* Goggin and Sommer, 1949, Pl. 1, *K*), although nowhere in quantity, and never in a clearly defined stratigraphic position.

The type is characterized by heavy pinching of the outside surface (Fig. 78, *A–B*). This pinching varies greatly in size, neatness, and amount of surface covered. A simple band on the rim is perhaps most common; on occasions the pinching is varied to form simple designs. In some instances, at least, the pinching is on the bottom of the vessel. One example with a red painted interior has been noted on the Keys.

The limited stratigraphic data from Bear Lake 1, suggest that the type is found in a previously unrecognized horizon, now to be called Glades IIc (see conclusions of this paper). Its range on either side of this horizon is not yet known. Information from Upper Matecumbe Key (Goggin and Sommer, 1949) supports this dating, in that the type occurs there only in mixed levels containing Glades II and Glades III materials, not in the pure levels of either one. Thus, an intermediate position between Key Largo Incised and Surfside Incised is suggested.

*Key Largo Incised.* An important marker type, this was one of the earliest Glades Area forms recognized (Goggin 1940, p. 25*a;* 1944*b*, Fig. 1, *a–f*), although not defined as a type until later (Goggin, 1944*a*, Fig. 1, *a*, *b*, *f*). It is characterized by a series of downward opening loops or arcades incised on the rim of the

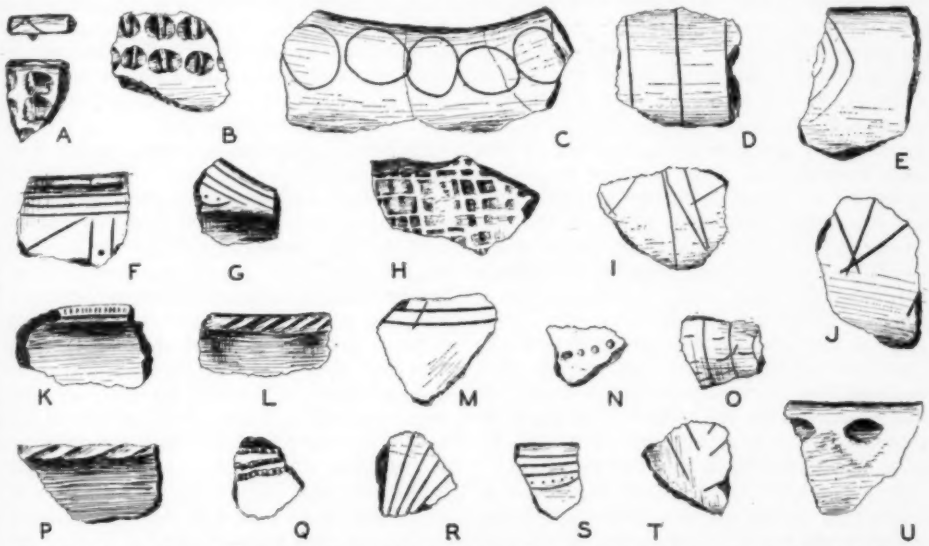


FIG. 78. Potsherds from the Everglades National Park: *A*, Plantation Pinched, Bear Lake 1, Test 1, 30″–36″; *B*, Plantation Pinched, Bear Lake 1, Test 1, 24″–30″; *C*, unclassified incised gritty ware, Bear Lake 1, Test 2, 0″–6″; *D*, unclassified incised gritty ware, Cane Patch, 12″–18″; *E*, unclassified incised gritty ware, Cane Patch, 24″–30″; *F*, unclassified incised and punctated gritty ware Bear Lake 1, Test 1, 6″–12″; *G*, Surfside Incised (variant), rim lug, Bear Lake 1, Test 1, 12″–18″; *H*, Biscayne Check Stamped, Cane Patch, 0″–6″; *I*, unclassified incised gritty ware, Bear Lake 1, Test 2, 0″–6″; *J*, unclassified incised gritty ware, Bear Lake 1, Test 2, 0″–6″; *K*, Fort Drum Incised, Cane Patch, 36″–42″; *L*, Fort Drum Incised, Cane Patch, 36″–42″; *M*, unclassified incised gritty ware, Bear Lake 1, Test 1, 42″–48″; *N*, unclassified punctated gritty ware, Bear Lake 1, Test 2, 24″–30″; *O*, unclassified incised gritty ware, Cane Patch, 6″–12″; *P*, unclassified tooled-rim gritty ware, Bear Lake 1, Test 1, 36″–42″; *Q*, Cane Patch Incised, Cane Patch, 36″–42″; *R*, unclassified incised gritty ware, Bear Lake 1, Test 1, 12″–18″; *S*, unclassified incised and punctated gritty ware, Bear Lake 1, Test 1, 42″–48″; *T*, unclassified incised gritty ware, Bear Lake 1, Test 1, 24″–30″; *U*, unclassified deep-punctated gritty ware, Bear Lake 1, Test 2, 42″–48″.

vessel. These vary somewhat in size and form but on any single vessel they are neatly and symetrically executed (Fig. 77, *E, J–T*). Rarely two concentric loops appear (Fig. 77, *N–O*).

Vessels are usually medium-sized bowls with a slight to medium constricted orifice. The lips of vessels in late Glades IIb time may be modified by gentle crimping or by incised broad arcs (Fig. 77, *E, J–L*).

The type is the most important single diagnostic for Glades II times, occurring, on the basis of present knowledge, throughout the period.

*Matecumbe Incised.* This is another common form of long recognition (Goggin, 1944*a*, Fig. 1, *c–e;* 1944*b*, Fig. 1, *h*). The incised design on this type is a crosshatch or diamond pattern. Size of the delineated "diamonds" varies from less than 1 to 3 centimeters in width (Fig. 77, *U–W, Y–Z*). Vessel forms and lip modifications are similar to those of Key Largo Incised. Matecumbe Incised is limited temporally to the Glades IIb period.

*Miami Incised.* This type is decorated with groups of diagonal parallel lines on the rim (Fig. 77, *F, H*), usually in units of four lines separated by a space of equal width (Goggin, 1944*a*, Fig. 1, *g–h;* 1944*b*, Fig. 1, *g, i*). The lines vary from as many as six to as few as three.

Details of the range of vessels and lip form are not known. Apparently bowls are the only vessel shape. The type is most characteristic of Glades IIa but is also found sporadically a little later.

*Opa Locka Incised.* This widely distributed type is nowhere abundant (Goggin, MS), so its sharp occurrence here is of interest. It is distinguished by vertical rows of concentric arcs or semicircles, made on the rim either by incision or by a fingernail impression (Fig. 77, *D, G, I*). Vessels are all bowl forms.

In the past the temporal position of the type was simply recognized as Glades II, although it was known not to be late in that period. The data from Bear Lake 1 and Cane Patch clearly place it in the Glades IIa horizon. Seriation data from elsewhere support such a conclusion (Goggin, MS).

*Fort Drum Incised.* This type, defined on the basis of material not stratigraphically placed (Goggin, MS), is characterized by a row or rows of short incised lines or large ticks on the outside edge of the lip or on the rim of the vessel (Fig. 77, *A–C;* Fig. 78, *K–L*).

On not completely satisfactory evidence, the type was previously attributed to Glades II times, or to be more precise, to Gordon's Pass II (Goggin, MS), the late period at the site of Gordon's Pass (Goggin, 1939), which has been equated with Matecumbe I, both being placed in the major horizon Glades II. On the basis of the data discussed here, Fort Drum Incised belongs in the Glades IIa period, apparently in the earliest part.

*Cane Patch Incised.* This type is briefly described here, but will be considered in more detail in the forthcoming major paper on the Glades Area (Goggin, MS). It has sporadically appeared in surface collections but is nowhere abundant, and was not previously stratigraphically placed.

This type, with a usual Glades series paste, is decorated by simple designs executed in a drag and jab incised technique. The sherd from Cane Patch (Fig. 78, *Q*) does not have an obvious pattern; the specimens from elsewhere, though, have a simple design of a meander or running linked V's, formed on the rim by one or two drag and jab incised lines. Characteristically, the tool used in making the incision has a rough end leaving numerous striae on the bottom of the incised channel.

This type appears to belong to the early Glades IIa horizon.

*Unclassified incised gritty ware.* This catch-all category includes, in general, sherds marked with a single incised line. Some are probably fragments of well known types. Others are unique and unclassifiable. These include a well known but not yet defined type with a fairly detailed (for the Glades Area) design on the rim. This is usually a broad band, sometimes broken into panels, filled with incisions and occasionally punctations (Fig. 78, *F;* Brookfield and Griswold, 1949, p. 12). It is a form which undoubtedly develops directly out of Surfside Incised (Goggin, MS). Other forms of incision (Fig. 78, *C–E, I–J, M, O, R, T*), as well as those of incision plus punctation (Fig. 78, *S*), apparently represent attempts of the potter to create something new, since they do not appear to be related to any other type, nor do they seem to be the result of stimuli from trade pottery types.

*Biscayne Plain.* This is a plain chalky ware type belonging to the Biscayne series. It is distinguished by its lack of temper and its soft surface having a chalky feel (Goggin, 1940, 1944*a;* Goggin and Sommer, 1949; Willey, 1949). Although occurring throughout Glades

II and III periods, and perhaps earlier elsewhere in the Glades Area, it is present here only rarely in mixed Glades II and III and in Glades III levels.

*Biscayne Check Stamped.* Having a chalky ware paste, similar to Biscayne Plain, this type is characterized by check-stamped impressions (Goggin, 1940, 1944*a*; Goggin and Sommer, 1949; Willey, 1949). Checks on this type vary greatly in size, a variation apparently of temporal significance elsewhere in the state (Griffin, 1948). The three specimens from Bear Lake 1 fall in the category of small checks, but the one from Cane Patch bears large impressions (Fig. 78, *H*).

*Biscayne Red.* An uncommon type in the region, Biscayne Red is similar to Biscayne Plain but has a red painted surface. Three sherds were found in a Glades IIa level.

*Goodland Plain.* This ware, only recently described (Goggin, 1950), does not fit into either of the major ware categories of the area. In many respects it is like chalky ware but includes much fine grit in the paste (not coarse sand like the Belle Glade paste). In its greatest concentration it appears in Glades I times.

*Goodland Red.* This type is similar to Goodland Plain except for the heavy red paint applied to one or both vessel surfaces. This appears in Glades I and early IIa times.

*Majolica.* The term majolica is used here to denote a soft paste pottery with a basic heavy white or cream opaque glaze or enamel characterized by a tin or mixed tin and lead composition. A single white sherd of this ware from Rookery Mound bears no ornamentation.[10] This is undoubtedly of Spanish derivation and is generically related to the soft paste, stanniferous glazed wares distributed around the Mediterranean and in the Near East. This example was most likely made at Puebla in Mexico and is the form called *loza blanca de Puebla* (Cervantes, 1939) or Hispano-Mexican (Smith, 1948).

## ARTIFACTS

### NON-CERAMIC

In this paper it will be impossible to do more than briefly present a glossary of artifacts, but those new or of special interest will be noted in some detail. Descriptions of many of these will be found in Goggin and Sommer (1949) or Willey (1949); all are described and discussed in detail in Goggin (MS). Their order of presentation follows the functional grouping (not given here) used in the last mentioned paper.

*Busycon dipper.* A single questionable specimen may be an example of this widely found shell vessel, reported from all parts of Florida and much of the Southeast. Our possible specimen, from Cane Patch, was found in a Glades IIb horizon.

*Busycon Pick A.* This is the most widely distributed and commonest of the whole-shell Busycon tools. It is characterized by a notch on the lip, a hole in the opposite whorl, and a ground beak (Fig. 79, *X*). Examples were found at all sites in the Glades IIa, IIb, IIc, and either IIIb or IIIc horizons.

*Strombus celt.* This common celt of the Tekesta subarea occurs only in Test 2 at Bear Lake 1. Two examples date from Glades I and IIa periods, but elsewhere the type is found throughout the whole time range. A *Strombus gigas* lip, probably a blank for this type of celt, also dates from Glades IIa times at the same site.

*Busycon celt.* Celts of this form are rare in the Glades area, most examples being known from the northern part, especially at Belle Glade (Willey, 1949). Elsewhere in the state they occur mainly on the Gulf Coast. One blade fragment came from Cane Patch in a Glades IIa level.

*Perforated shark tooth.* This object (Fig. 79, *P*) is believed to have formed part of a shark tooth knife or else was set in a wooden club. Such uses are known from other material, these perforated teeth being widespread. Here, one example was found at Bear Lake 1 in a Glades IIb horizon.

*Macrocallista knife.* Although abundant in this region, these artifacts are of rare occurrence elsewhere. They are formed by chipping a sharp edge along one-half to two-thirds of the lip of a large *Macrocallista nimbosa* shell (Fig. 79, *DD*). Specimens were found at Bear Lake 1 (4) and Rookery Mound (2), in Glades IIa, IIb, IIc, IIIa, and IIIb or IIIc horizons.

*Busycon hammer C.* Tools of this form are abundant in the Calusa subarea, although rare in the Tekesta subarea. They are characterized by a notch on the lip, an opposite perforation, the removal of a section of the outer whorl to the right of the aperture, and a battered and worn beak (Fig. 79, *Z*). Two specimens from

[10] A similar sherd from here collected earlier by Charles M. Brookfield has a blue design on the white background (Y.P.M. 142808).

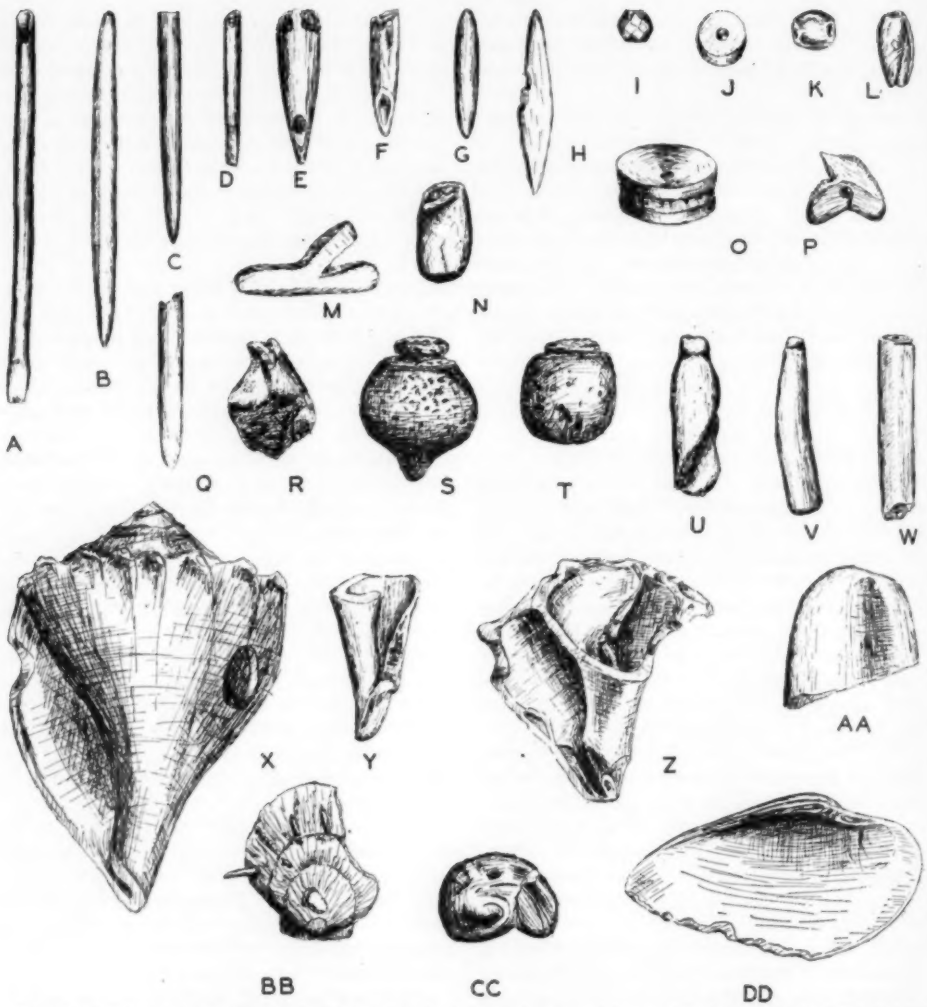


FIG. 79. Artifacts from the Everglades National Park; *A*, bone pin, screw-driver variety, Bear Lake 1, Test 1, 12″–18″ *B*, long bone point, Bear Lake 1, Test 2, 24″–30″; *C*, bone pin fragment, Bear Lake 1, Test 1, 12″–18″; *D*, bone pin, screw driver variety, Bear Lake 1, Test 2, 24″–30″; *E*, short socketed bone point, Cane Patch, 0″–6″; *F*, short socketed bone point, Cane Patch, 0″–6″; *G*, small bone point, Bear Lake 1, Test 1, 54″–60″; *H*, short bone point, Bear Lake 1, Test 2, 12″–18″; *I*, glass bead, Cane Patch, 0″–6″; *J*, shell bead, Cane Patch, 36″–42″; *K*, shell bead, Bear Lake 1, Test 1, 18″–24″; *L*, Oliva bead, Bear Lake 1, Test 1, 30″–36″; *M*, unclassified stone object, Bear Lake 1, Test 1, 54″–60″; *N*, shell billet, Bear Lake 1, Test 1, 18″–24″; *O*, fish vertebrae bead, Cane Patch, 0″–6″; *P*, perforated shark's tooth, Bear Lake 1, Test 1, 48″–54″; *Q*, bone pin fragment, Bear Lake 1, Test 2, 24″–30″; *R*, stone pendant, plummet form, Rookery Mound, 0″–6″; *S*, stone pendant, plummet form, Bear Lake 1, Test 2, 0″–6″; *T*, stone pendant, plummet form, Cane Patch, 0″–6″; *U*, shell pendant, Cane Patch, 0″–6″; *V*, grooved bone pendant, Bear Lake 1, Test 2, 18″–24″; *W*, grooved bone pendant, Bear Lake 1, Test 2, 30″–36″; *X*, Busycon pick A, Bear Lake 1, Test 2, 12″–18″; *Y*, fractured shell tip, Bear Lake 1, Test 2, 24″–30″; *Z*, Busycon hammer C, Bear Lake 1, Test 1, 54″–60″; *AA*, stone hone, Bear Lake 1, Test 2, 54″–60″; *BB*, perforated Spondylus shell, Cane Patch, 0″–6″; *CC*, worked marl object, Bear Lake 1, Test 2, 12″–18″; *DD*, Macrocallista knife, Bear Lake 1, Test 1, 24″–30″.

Bear Lake 1 date from Glades IIb times.

*Fasciolaria hammer (?) fragment.* One worn and broken Fasciolaria columella may be from a tool of this type. The form is most common in the Calusa subarea. Our specimen came from a Glades IIb horizon at Cane Patch.

*Busycon pounder.* One example of this tool came from well down in the Glades I horizon at Bear Lake 1. Elsewhere, the type is known only from the Calusa subarea.

*Strombus celt-hammer.* A well defined type, this artifact is most common in the Tekesta subarea. One specimen from Bear Lake 1 dates from Glades IIIa.

*Hammerstone* (?). A rounded piece of limestone may have been a hammerstone. Although widely distributed, the artifact is nowhere common. This specimen, from Bear Lake 1, dates from Glades IIIa times.

*Columella awl.* This is another tool of limited occurrence. It is nothing more than a small Busycon shell columella ground to a sharp point. One specimen came from Cane Patch in a Glades IIb level.

*Thin grinding slab.* Three fragments of this tool were found. The type is a simple slab of fine grain sandy limestone worn flat through use. Specimens dating from a Glades IIb horizon were found at Bear Lake 1.

*Stone hone.* A small piece of fine grain sandy limestone showing grooves, resulting from its use as a sharpening implement, came from a Glades I level at Bear Lake 1 (Fig. 79, *AA*).

*Pumice smoother.* This is a small piece of pumice flattened on one side by wear. It is a widespread form in the Tekesta subarea. Our specimen, from Bear Lake 1, dates from Glades IIb.

*Smoothing stones.* Two pieces of limestone, perhaps used for grinding or smoothing purposes, came from a Glades IIa level at Bear Lake 1.

*Small bone point.* One specimen of this widespread form of projectile point was found here (Fig. 79, *G*). This was in a Glades IIb level at Bear Lake 1.

*Short bone point.* A single specimen was found in Test 2 at Bear Lake 1 (Fig. 79, *H*). It dates from Glades IIa times.

*Long bone point.* This type is also represented by one specimen from Bear Lake 1, Test 2 (Fig. 79, *B*). Its dating is Glades I.

*Short socketed bone point.* Sections of hollow mammal bone, the articular end removed, the base cut square, and with a point formed by a diagonal cut, constitute this type (Fig. 79, *E–F*). Two examples of this widespread form were found in a mixed Glades IIb and III level at Cane Patch.

*Perforated Spondylus shell.* A single valve of this shell had a central perforation (Fig. 79, *BB*). This is a new type of artifact whose use is not known. However, other species of perforated shells appear to have functioned as net weights; perhaps this was used similarly. The specimen came from the mixed Glades IIb and III level at Cane Patch.

*Shell beads.* The presence of five shell beads here is unusual, for they are rare in the Glades Area. Four disk beads, averaging about 14 mm. in diameter and 4–5 mm. in thickness (Fig. 79, *J*) came from a level dated as either Glades I or IIa at Cane Patch. A single bead of a square variety with rounded corners was found in a Glades IIc level at Bear Lake 1 (Fig. 79, *K*).

*Oliva bead.* This simple type bead, made by removing the spire of an *Oliva* shell, is represented in all parts of the Glades Area. Here specimens come from Glades IIa and IIc levels at Bear Lake 1 (Fig. 79, *L*).

*Fish vertebrae beads.* Shark vertebrae made into beads by a simple perforation of the center occur sporadically throughout the Glades Area (Fig. 79, *O*). Specimens were found at Bear Lake 1 (13) and Cane Patch (2) in Glades IIIa and mixed Glades I, IIa, IIb, and III horizons.

*Stone pendant; plummet form.* Two crude specimens of this pendant type occur in our collections. Each is simply made of a small limestone fragment or pebble, roughly shaped, with a groove fashioned at one end (Fig. 79, *R, T*). They were present in the mixed Glades IIb and III level at Cane Patch, and in the Glades IIIb or IIIc level at Rookery Mound.

A better formed pendant of this type comes from a Glades IIb level at Bear Lake 1. Although now eroded it was well formed with a distinct grooved stem and basal point (Fig. 79, *S*).

*Shell pendant; single groove columella form.* This type is made from a slender Busycon columella, ground and shaped, with a single groove around one end. (Fig. 79, *U*). A specimen comes from the mixed Glades IIb and III level at Cane Patch.

*Grooved bone pendant.* Two examples of tubular bone sections grooved for suspension were found in Test 2, Bear Lake 1 (Fig. 79, *V–W*). They date from Glades I and IIa times.

*Bone pin.* Fragments (11) of bone pins were found at all sites. With two exceptions, described below, the remains were too small to determine the specific type. They date from Glades IIa, IIb, and IIIa.

*Bone pin; screw driver variety.* This new form is so called because of its close resemblance to a screw driver (Fig. 79, *A*). It came from a Glades IIIa horizon in Test 1, Bear Lake 1. Another, perhaps a simpler variant (Fig. 79, *D*) from Test 2 at the same site dates from Glades IIa.

*Shell billet.* A small neatly worked section of Strombus shell has no known function. It measures 32 mm. in length and 11 by 17 mm. in cross section (Fig. 79, *N*). It was present in a Glades IIc level at Bear Lake 1.

*Fractured shell tip.* One example (Fig. 79, *Y*) of this questionable artifact was found in a Glades IIa level at Bear Lake 1. This rare form is a fragment of Strombus shell showing no artificial working. In the West Indies where it is common it is considered to be an artifact (Rouse, 1941, p. 102; Osgood, 1942, pp. 34–5).

*Pumice ball.* A near spherical piece of pumice came from Bear Lake 1. It may have been naturally shaped or else crudely formed by man. It dates from Glades I times.

*Worked bone.* A section of bone from Bear Lake 1 shows working, but its function is not known. Another bone (turtle ?) from the same site bears a perforation through the end which may be either deliberate or accidental through decay.

*Worked marl object.* A fragmentary object carved from soft marl is like a miniature bowl with a crude incised design on the outside (Fig. 79, *CC*).

*Worked sting ray spine.* This specimen is too small to determine its function, but may have been a point. It was found in a Glades IIb level at Cane Patch.

*Unclassified stone object.* This Y-shaped specimen (Fig. 79, *M*) is unlike anything else from the area. It is neatly made from fine grain limestone, measures 41 mm. in length, and has no apparent function. Glades IIb is the temporal horizon of this specimen at Bear Lake 1.

*Glass bead.* Unfortunately, this specimen is not readily classifiable as an early or a late form. It is a medium sized bead, 10 mm. long and 11 mm. in diameter. The surface is faceted and the material is a clear dark blue in color (Fig. 79, *I*). The perforation is very large and uniform. It comes from the surface level, a mixed Glades IIb and III horizon at Cane Patch.

## SUMMARY AND CONCLUSIONS

Small test excavations at three sites, Rookery Mound, Bear Lake 1, and Cane Patch, have revealed deposits of refuse representative of several cultural horizons. While no single test at any of the sites reveals a clear cut pattern of long occupation, together they present a sequence which covers most of the known periods of occupation in the Glades Area.

Previous work, as already noted, had established a local sequence for the Tekesta subarea, which in turn was correlated with other sequences to form a master chronology for the Glades Area. The results of our excavations confirm, in general, the accepted sequence. However, they also reveal what appears to be a clear-cut new horizon within this sequence. This horizon, represented by three levels (18–36 inches) in Test 1 at Bear Lake 1, was overlooked before because it is characterized by a lack of decorated types (one possible exception will be noted). Only in a detailed sequence, as here, could it be found by stratigraphic testing and, with a lack of marker types, it is unidentifiable by surface collecting. The presence of Plantation Pinched in this horizon is of interest, but the sample is too small to indicate its value as a marker. The horizon will be given a local name Matecumbe Ic and a master sequence designation of Glades IIc.

Glades I is not a well known horizon in any area and was especially poorly known in the Tekesta subarea. It is of interest, therefore, to find it clearly represented at Bear Lake 1, in Test 2, and possibly at Cane Patch. The artifact sample is not large in the lower levels of this last site (30–48 inches), but the absence of diagnostics of Glades II is very suggestive of a pre-Glades II horizon. On the other hand, incised body sherd fragments in the 30–36 inch levels are suggestive of Miami Incised, although they cannot be identified with positiveness. In addition, Fort Drum Incised and Cane Patch Incised are represented by single examples in these levels. The lack of Goodland Plain in these levels argues, perhaps most convincingly, against their equation with Glades I.

With these modifications our sequences become the following:

| *Master sequence* | *Tekesta subarea sequence* |
|---|---|
| Glades IIIc | Matecumbe IIc |
| Glades IIIb | Matecumbe IIb |
| Glades IIIa | Matecumbe IIa |
| Glades IIc | Matecumbe Ic |
| Glades IIb | Matecumbe Ib |
| Glades IIa | Matecumbe Ia |
| Glades I | |

Although most of the artifacts are of types previously known, many are of interest for various reasons. The large number of Macrocallista knives is surprising, for hitherto the type was found only rarely and in the Calusa subarea. Shell beads are also uncommon in the Tekesta subarea, the five found being more than those obtained by the writer in all previous work. The Busycon celt is likewise a rare type, being most characteristic of regions to the north. Bone pins were numerous, as usual, but a new form, the screw driver variety, appears here.

The ceramics are of interest. On the basis of stratigraphic information, two forms previously recognized as variations, are now given type status. These are Plantation Pinched and Cane Patch Incised. It has also been possible to study modal variations in the general ceramic picture irrespective of typology. The results of this study have already been noted and will again be outlined in the following paragraphs.

In summary the characteristics of the various periods, from early to late, and the special local features are as follows:

*Glades I.* This possible horizon had previously been characterized as lacking decorated pottery, Glades Plain and Biscayne Plain being the sole forms. New data from Bear Lake 1 indicate that Goodland Plain, and perhaps Goodland Red, are also components of the period.[11] It is not clear whether Fort Drum Incised belongs in this period or not. The presence of three sherds (at Bear Lake 1 and Cane Patch in levels ascribable or possibly ascribable to this period) is not understood. They may be accidental intrusions or may belong where found. The possibility of Cane Patch Incised being present in this horizon must also be considered.

*Glades IIa.* The previously accepted diagnostics of this horizon were Key Largo Incised and Miami Incised. However, at Bear Lake 1 and Cane Patch, the additional association of Opa Locka Incised clearly indicates its position as a marker for this time level. Since less refined data from elsewhere had indicated the type's position in general Glades II times, there is no conflict in such a correlation.

*Glades IIb.* This well known horizon is characterized by Key Largo Incised and Matecumbe Incised pottery. Data from Bear Lake 1 and Cane Patch corroborate the previous picture. However, modal or trait analysis of ceramics in these sites reveal further information about the period.

In the last half of the period, the trait of incising arcs on vessel lips appeared in all pottery types, Glades Plain, Key Largo Incised, and Matecumbe Incised, and on unclassified incised forms of gritty ware as well. The distribution of this trait at Cane Patch and Bear Lake 1 is so consistent that we can use it to distinguish between early and late Glades IIb, the former being characterized by its absence and the latter by its presence.

Also found to some extent in late Glades IIb times is the practice of slightly crimping or notching vessel lips. The erratic distribution of this trait in subsequent horizons renders it somewhat uncertain as a diagnostic. Nevertheless, on types confined to Glades IIb it is late.

*Glades IIc.* This newly recognized horizon apparently has little of a distinctive nature, pottery being mainly Glades Plain. However, there is a possibility that Plantation Pinched may be a marker type for the horizon. Data from elsewhere support such a tentative conclusion.

Glades IIc may have been briefly represented in the previous excavations at Upper Matecumbe Key, but was mechanically included in the mixed I and II levels, from which Plantation Pinched was obtained (Goggin and Sommer, 1949).

*Glades IIIa.* This period is distinguished by the type Surfside Incised, in addition to the omnipresent Glades Plain. Surfside Incised often has rim lugs, which are unusual since vessel appendages are atypical of the Glades area. Rarely, more elaborate incised forms, apparently developed out of Surfside Incised, are also found.

*Glades IIIb.* The introduction of Glades Tooled heralds a dying out of the long Glades tradition of incising pottery and marks the beginning of this period. It is not clear whether

[11] Goodland Plain material was undoubtedly classified as Glades Plain when this horizon was first recognized (Goggin, 1939).

there is an overlap of Surfside Incised and Glades Tooled. If there was a short period when both are found, the former type soon died out. Our deposits of this horizon are not extensive.

*Glades IIIc.* Glades Tooled is now clearly alone as the only common decorated aboriginal type, but the distinctive marker for the period is the introduction of European material, tentatively placed at about 1530 A.D. The top level (0–6 inches) at Rookery Mound clearly dates in part from this period, as is demonstrated by the presence of Glades Tooled pottery and our find of a majolica sherd, as well as by the previous find of majolica and Chinese porcelain on the surface.

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University of Florida
Gainesville, Florida
April, 1949

# FACTS AND COMMENTS

## ANOTHER PROBABLE CASE OF PREHISTORIC BEAR CEREMONIALISM IN NEW YORK

In a prior paper I have described, from central New York, an archaeological instance of probable bear ceremonialism in the Owasco culture.[1] A recent find in western New York, although of somewhat dissimilar character, strengthens the probability of the existence prehistorically in New York of a special and reverential attitude toward the bear, this time apparently among an Iroquois people. Briefly, the nature and circumstances of the new discovery are as follows.

During the fall of 1948, workmen digging sand and gravel from a small private pit on the L. P. Palmer farm, situated in the Oatka Creek Valley, on the Mumford Road, 7/10 of a mile west of the village of Scottsville, Monroe County, New York, uncovered an adult male skeleton in a flexed position, without accompanying grave goods. Soon thereafter a second similar burial came to light. The calvarium of the first-found skeleton[2] was subsequently brought to the Rochester Museum by the sheriff's office and our investigation of the site followed. It was learned that both burials were uncovered about 3 feet below the surface of a low gravel rise, east of the road and some quarter mile from Oatka Creek. Most of the post-cranial bones had been badly damaged by the gravel-diggers but the remaining portions of the skeletons, still scattered in the pit, exhibited neither unusual morphological characteristics nor lesions of trauma or disease. The cranium of the second skeleton was presented by the finder to the Scottsville Central School, whose science instructor, Mr. Earnest T. Staines, kindly lent it to the museum for study.

On April 2, 1949, accompanied by Mr. Gordon K. Wright of the Anthropology Division of the Rochester Museum and Mr. John A. Angus, the writer began excavations into the exposed gravel face and along the top of the rise. At a point about midway in the pit between the loci of Burials 1 and 2, the outline of a third grave became visible in the vertical wall, as a U-shaped area of darker gravel, 36 inches deep and 26 inches in width. The skeleton found therein pertained to a child with a dental age of about six years, interred in a closely flexed supine position, again without mortuary objects. Pressure fracture and decay had reduced the bones to a very poor condition. The mandible was remarkable for excessive caries and alveolar abscesses.[3]

In exploring the periphery of this burial there was exposed, immediately adjacent to the southwest, a pit, which proved to have a maximum top diameter of 50 inches and a depth of 63 inches. It was capped by 7 inches of plow-disturbed topsoil, above 2 inches of dark colored gravel, which in turn overlay a 3-inch concavo-convex lens of extremely black granular soil, similar to that described as having occurred over Burials 1 and 2, but absent from Burial 3. This feature, frequently observed by the writer overlying graves and storage pits, is to be attributed not to a funerary fire built over the grave, as is so commonly supposed by collectors, but to an accumulation of decomposed duff or forest mould in the depression resulting from the settling of the grave fill, attendant upon the decay of the body and its wrappings.[4]

Below the upper duff layer the fill consisted for 10 inches of charcoal-flecked brown gravel, in the lower portion of which was found a compact mass of black bear bones and the fragmentary skull of a Virginia deer. These rested just above a second 2-inch down-curving black soil stratum, evidently another duff zone, marking the top of an older pit, probably a food storage cache, since the inferior 46 inches of fill consisted only of sterile brown gravel. This feature was accordingly interpreted as an abandoned food cache later utilized as a refuse pit, a common enough phenomenon on archaeological sites. Since artifactual remains were wanting from both horizons it was assumed that a single occupation was represented by perhaps seasonal utilization.

Figure 80 shows the bone magma partially uncovered, while Figure 81 illustrates a sample of the remains which, with the exception of the deer calvaria mentioned, comprise the incomplete skeletons of a smaller and adult bear, probably a female, and a larger and immature animal, probably a male.[5] Both had been killed by a blow, probably dealt with a heavy solid club, rather than a pronged head, which would have produced a perforating lesion, as seen on certain dog remains exhumed by the writer on a later Seneca site. In each case the killer knew precisely where to strike in order to traumatize the brain and the character of the lesion is such as to demonstrate definitely that living or green bone was involved (e.g., the depressed areas of broken but still affixed marginal bone of the outer table and the larger area of shattered-out bone from the inner skull table).

Since the damage is to the right side of the brain box, either the blows were struck by a left-handed person attacking from the front or much more probably by a right-handed individual approaching the animal from the rear.

To the utilization of the carcasses for food, mute testimony is offered by numerous rude knife cuts, doubtless done with a stone blade in severing the ligamentous connections, since they occur principally around the articular areas of the long bones.[6] Charring, probably from roasting, is also present on one of the illustrated femurs (indicated by arrow 1). Of considerable interest is the intact condition of all the long bones, in marked contrast to the usual practice of splitting them for the sake of the marrow. As shown by arrow 2, the superior canines of the larger bear were broken out of the skull, presumably to be employed as decorative elements. It would seem that the presence of the deer skull, shown by arrow 3, also indicates a food de-

[1] William A. Ritchie, "Archaeological Evidence for Ceremonialism in the Owasco Culture," *Researches and Transactions of the New York State Archaeological Association*, Vol. 11, No. 2, Rochester, New York, 1947.

[2] Museum catalogue number AP 909.

[3] Museum catalogue number AP 903.

[4] Plowing fills and conceals these partially filled hollows, which may readily be seen on sites occupying uncleared land.

[5] The epiphyseal caps of the humerus are still unattached and the lines of union still visible on the pelvis and vertebrae.

[6] Present on the distal extremity of two tibiae, head of right femur, proximal extremity of two humeri and distal condyles of another, and on several vertebrae.

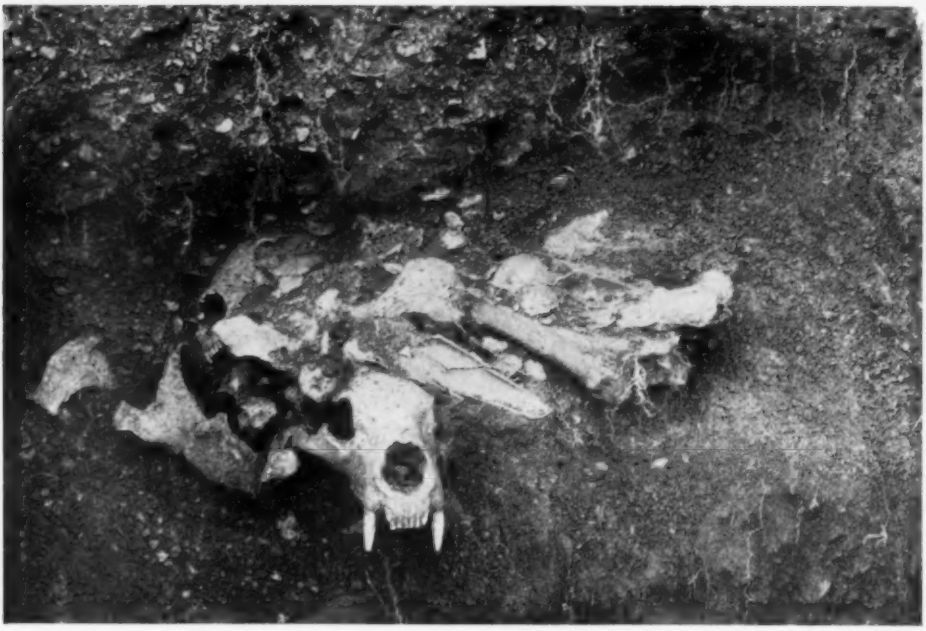

FIG. 80. Partially uncovered bear skeletons in pit, Scottsville, New York.

bris repository. In the case of this animal no special attitude was accorded the remains, hence no other portions of the skeleton occurred in the pit.

While it is impossible to account for the missing bear bones,[7] the evidence for the ceremonial killing, eating, and disposition of the unmutilated remains, safely away from dogs or other violating agents, would seem to be unequivocally established, and these factors constitute primary considerations in the bear cult, as widely observed in the boreal regions of both the Old and New Worlds.[8]

Strangely and unhappily, no artifactual evidence came to light either during the repeated excavations or in a minute scrutiny of the adjacent plowed fields. The human remains afford the only clue to the identity of the occupants and it must here suffice to state that metrically and morphologically the adult skulls, especially Number 2, conform very closely with the type known to pertain to the prehistoric Seneca Aspect of New York.[9] The skull of Number 1, according to Georg Neumann, who recently (June, 1949) studied, with the writer, a series of prehistoric and early historic Seneca crania in the Rochester Museum, has a somewhat more pinched nasal bridge and slightly more salient nasal bones than is usual in this group, but even in these minor aberrations it fits within the known Seneca range.

The Oatka Valley, especially the districts around Scottsville, Wheatland, Mumford, and Caledonia, is dotted with small cemeteries, in most instances not demonstrably associated with settlement sites,[10] although a few such stations are also recorded.[11] In common with prehistoric Iroquois cemeteries elsewhere the presence of grave goods is a great rarity, but such artifacts as do occur signalize the Iroquois, probably the prehistoric Seneca.

The nature of the Palmer site in respect to its situation, burial, and cranial typology is such as to suggest Iroquois provenience. But while the probability of bear ceremonialism as an institution of Owasco culture has been referred to, this is the first archaeological evidence known to the writer suggesting a ritualistic observance toward this animal among the Iroquois. In this connection the following quotation is pertinent in intimating a former condition in Iroquois society when this attitude, possibly obtained through Owasco heritage, may have constituted a significant element of the culture pattern.

Alanson Skinner "recounts the demonstration of a bear killing of the old-fashioned sort, told to him by William Blue Sky, a Seneca, now deceased. This Indian said that

[7] The recovered bear bones comprise the following: 2 complete crania, 4 humeri, 2 femora, 4 tibiae, 2 innominata, 4 scapulae, 3 patellae, 15 fragments costal cartilage, 23 rib fragments, 27 vertebrae, 1 calcaneum, 2 phalanges. The scarcity of foot bones suggests that they remained attached to the hides.

[8] A. Irving Hallowell, "Bear Ceremonialism in the Northern Hemisphere," *American Anthropologist*, n.s., Vol. 28, No. 1, 1926, pp. 1–174.

[9] William A. Ritchie, *Craniological Correlations with Aboriginal Cultures in New York*. (n.d.)

[10] The writer's files contain references to eight such sites, on several of which he has conducted successful excavations.

[11] Thus far no Owasco sites have been discovered here.

FIG. 81. Portion of the remains found, Scottsville, New York. Arrow 1 indicates charred area on femur; arrow 2, socket of extracted canine; arrow 3, deer calvaria.

years ago when working in the lumber district of Pennsylvania a bear came within sight of their camp. A hue and cry was raised and another Seneca, a rather old man at the time, said he would show them how the Indians used to kill bears. The animal was brought to bay at the foot of a tree with the help of dogs, at which point the Seneca made a speech to the animal (the nature of which is unknown), before clubbing him to death with a tomahawk. The old man then went on to tell them that the Seneca considered that it was always proper to club a bear to death in this way."[12]

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June, 1949

## HISTORIC CREEK POTTERY FROM OKLAHOMA

### INTRODUCTION

Despite the remarkable progress manifest in the archaeology of the Southeast, there remains an appreciable gap in our historical perspective between ethnological horizons and late period archaeological material. Pottery is one highly important time-indicator that persisted into historic times, yet for one of the major Southeastern tribes—the Creeks—pottery in ethnological museum collections is rare. For this reason, the authors here describe the single Creek pot in the Southeastern ethnological collection of the Chicago Natural History Museum. To our knowledge, this piece of pottery has not been described in print before.

The specimen shown in Figures 82 and 83 was received by the museum from the Department of Ethnology, World's Columbian Exposition in 1893. It forms part of a small accession of ethnological material collected among the Creeks in 1892 by George T. Shurtleff in, or in the immediate vicinity of, Muskogee, Creek Nation, Indian Territory. Although the documentation is scanty, the writers believe that the pot is of bona fide Creek manufacture.

### DESCRIPTION OF VESSEL

*Paste:*

Method of manufacture: Not evident, but we would suspect some type of coiling.

Tempering: Some organic substance that appears as carbonized blotches or occasionally as slag in the fired paste. This tempering is easily seen in cross section of the paste and in some instances can be seen on the vessel surfaces.

Texture: Medium coarse, compact, and well consolidated.

Hardness: Exterior and interior surface hardness 2.0–2.5. Hardness of core is 2.0–2.5.

[12] Hallowell, *op. cit.*, p. 35; cf. pp. 31–4.

FIG. 82. Two views of Creek pot.

Color: Ranges from light tan to dark gray. Core is light gray and medium gray with black blotches, presumably carbonized tempering.

*Surface treatment:*

The exterior body of the vessel has been roughened by brushing or scoring except for the narrow shoulder and rim area, which has been poorly smoothed. It rather looks as if the shoulder and rim area had been smoothed prior to the brush roughening or scoring of the remaining vessel exterior.

The striations produced by brushing or scoring are horizontal or nearly so in the area just beneath the shoulder of the vessel. But in the remaining and larger portion of the vessel exterior the striations slant or curve downward from left to right and reach to the base of the vessel.

The base of the vessel is rough but stippled rather than striated.

The vessel interior has been poorly smoothed and there are numerous fine striations encircling the vessel walls.

*Decoration:* None.

*Form:*

This vessel is a jar or pot with a flaring rim, a flat lip, and a flat circular base, There is a slight shoulder high on the vessel, an incipient neck or at least a constriction above the shoulder, and a narrow rim above the neck.

The vessel is 21–23 cm. high and 29 or 30 cm. in diameter at the mouth. The diameter at the neck or point of greatest constriction above the shoulder is 27.4 cm. and the diameter at the shoulder is 28 cm. The base is 10 cm. in diameter.

The thickness of the lip is 0.6 to 0.8 cm., that of the rim 1 cm., that of the shoulder 1 cm., that of the body 1 cm., and that of the base 1.1 to 1.4 cm.

## ARCHAEOLOGICAL CONSIDERATIONS

Pottery sherds representing vessels comparable to the Creek pot described above were collected from sites along the Canadian River in eastern Oklahoma by Mr. David Wenner of the University of Chicago in 1948. These sherds came from shallow midden deposits, where they were associated with manufactured (European) pottery of types in use about 1830 and later. Moreover, the shallow midden or camp sites were in the area of the Upper Creek Towns. Thus there is some probability that the pottery found by Mr. Wenner is actually Creek pottery made by Creek Indians after their removal to Oklahoma in 1836–40.

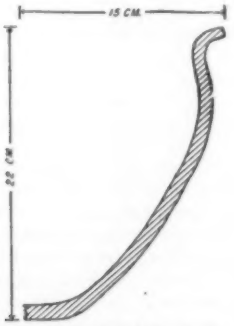


FIG. 83. Profile of Creek pot.

In Georgia several pottery types have been identified with Creek occupancy of the late seventeenth and early eighteenth centuries. One of these types, Walnut Roughened, has a surface finish markedly similar to that of the Creek pot described in this paper. The body of the type Walnut Roughened is brushed, scored, or stippled in the same fashion as the Creek pot from Oklahoma. However, Walnut Roughened is shaped differently and is decorated on

the upper body surface. In Georgia, Walnut Roughened has been identified with the Hitchiti (Creek) of about A.D. 1690–1720.

The Creek pot described in this paper resembles more superficially a pottery type called Plaquemine Brushed that is found in the protohistoric and historic horizons of eastern Louisiana and southwestern Mississippi. However, the brushing on Plaquemine Brushed is much more carefully executed and often arranged to form designs.

In east Texas there have been found pottery types with a brushed exterior, but these fall within the range of variation for Plaquemine Brushed and do not seem to resemble the Creek pot from Oklahoma.

On the basis of the available archaeological evidence, the Creek pot from Oklahoma seems to belong to a heretofore undescribed pottery type, which has no close relatives elsewhere in the Southeast, but at least on the basis of surface treatment, may be related to a Creek pottery type in Georgia.

It is tempting to hypothecate that the Creek pottery from Oklahoma is at least in part a descendant of late seventeenth and early eighteenth century Creek pottery from Georgia.

### ETHNOLOGICAL CONSIDERATIONS

The Creeks are known to have given up large scale manufacture of domestic articles at a relatively early date, and their traditional material culture was certainly well on the decline before their removal from the Southeast to Indian Territory in the years 1836–40. However, in field work among the neighboring Seminole in Oklahoma in 1938, Spoehr found two elderly women informants who had seen pottery made and used occasionally among their tribes-people in the early days in Oklahoma. It therefore seems probable that there were also Creek women who brought knowledge of the potter's art with them at the time of removal.

There were also two occasions in the history of the Creeks in Oklahoma when they may well have been forced to rely on a knowledge of pottery-making for utensils. The first occasion was in the years immediately following the removal to Indian Territory, when the tribe was poverty-stricken and destitute of household possessions. The second occasion was the violent disruption caused by the participation of the Creeks in the Civil War. Although this conflict was not of their making, the tribe split into northern and southern sympathizers, who vigorously fought each other and succeeded in destroying their houses and possessions. The pot described here may possibly date from this latter period.

Additional evidence exists for historic Creek pottery in Oklahoma. In 1948, Mr. Wenner noted several historic Creek pots in the old Creek council-house, now a museum, in Okmulgee, Oklahoma, and during the course of archaeological survey of sites along the Canadian River found a number yielding surface sherds similar to the pot here described, mixed with fragments of nineteenth century china (see Archaeological Considerations). There is an excellent possibility, therefore, of combining the techniques of archaeology and ethno-history in establishing the character of historic Creek pottery, and in clarifying historical perspective in the Southeast by a further tying together of archaeological and ethnological data. It is hoped that this communication will stimulate interest in the problem.

GEORGE I. QUIMBY
ALEXANDER SPOEHR
Chicago Natural History Museum
Chicago, Illinois
June, 1949

## FURTHER COMMENTS ON THE WOODEN FIGURE FROM MEXICO

Dr. K. A. Nowotny's note on the Xolotl figure in the Museum für Völkerkunde, Vienna[1] raises some points of general interest. First, Xolotl is mentioned as related to Quetzalcoatl in a rather obscure way in the Codex Magliabecciano.[2]

The writer, talking of Quetzalcoatl says: "este dizen que fue hijo de otro dios que llaman mictlan tecutli, que es señor del lugar delos muertos. y es de otro ydolo que llaman xulutl que quiere dezir un modo de pan que ellos tienen hecho de bledos y mahiz." In all the codices which contain the tonalpouhualli, Xolotl is given as Lord of the thirteen day period Ce Cozcaquahtli, associated with the sign of the setting sun entering the jaws of the earth. In Borbonicus, p. 26, one sees an excellent representation of Xolotl and Quetzalcoatl facing one another at a dance of the priests. In the mythological sections of Borgia, Quetzalcoatl is shown as a pair of beings descending through creation. It seems that we have not paid enough attention to the secondary meaning of Quetzalcoatl, the "Precious Twin." Xolotl is the Evening Star, Lord of Sunset, just as his twin Quetzalcoatl is Morning Star.

To return to the Vienna figure, appendages worn at the side are to be seen as part of the costume of many personages in Borbonicus, and, in Codex Mendoza, Aztec nobles appear with a great bunch of feathers pendant over each shoulder. The two side triangles on the figure probably represent pendants of this type. That the small head should prove to be of jet is of much interest, because the skull-mask in the British Museum is partly faced with squares of lignite. Of similar technical interest is the decoration with lacquer; this can be matched with a lacquered bowl (much worn but with pattern still discernible) now in Glasgow, and with the lacquer lining of the double-crested helmet in the British Museum.

I wonder, can the figure be part of the 1519 treasure like Codex Vindobonensis itself? Xolotl was definitely early on the Vera Cruz coast, where Vindobonensis was collected, and may even be the dog-headed deity of the Tajin ball court.

C. A. BURLAND
British Museum
London, England
August, 1949

It is very difficult to establish connections between Quetzalcoatl or Xolotl (or pairs of Quetzalcoatl figures or

[1] Karl Anton Nowotny, "A Unique Wooden Figure from Ancient Mexico," AMERICAN ANTIQUITY, Vol. 15, No. 1, pp. 57–61, 1949.

[2] *Codex Magliabecciano*, ed. Duc de Loubat, Danesi, Rome, 1904, p. 61 and text.

Xolotl figures in the Codex Vindobonensis) and the characteristic American myths about twins. The theoretical connection with morning and evening star belongs in the realm of nature mythology. The Codex Vindobonensis also suggests connections with the sun and moon.[3] Aztec sources, such as Sahagun, are silent about most of the myths of the deities; or, like the *Historia de los Reynos de Colhuacan y Mexico* (*Anales de Cuauhtillan*), they cite only myths in some way related to the mythical history of the race. Only the commentated copies of picture manuscripts (mentioned above by Mr. Burland) contain brief references to such myths. To complicate the problem, in the Mexican area we have to deal with a mingling of mythical material among historical facts.

A documentary pursuit of the history of an ancient Mexican treasure like the Xolotl in Vienna is impossible. An inventory like that of Ambras Castle in 1596 is a rare exception. And even there the figurine of Xolotl is not mentioned. Even the notice of 1537 in the Codex Vindobonensis, mentioning this figurine as a gift of King Emanuel of Portugal (who died in 1521!) to Pope Clement VII (who became pope in 1523!), is in obvious contradiction to the clear description of Petrus Martyr. The association of this codex with the first mission of Cortes depends solely on that notice. While the Codex Vindobonensis is written on leather, the detailed descriptions of Petrus Martyr refer only to books on bark paper. To this day it is difficult to explain how the conquistadores obtained books from the Mixteca in the first weeks after their arrival on the coast of Vera Cruz.

KARL ANTON NOWOTNY[4]
Vienna, Austria
October, 1949

## A TRANSLUCENT SHELTER FOR FIELD WORK IN REGIONS WITH HIGH PRECIPITATION

Heavy and frequent rainfall is a serious obstacle to archaeological work on the North Pacific Coast. Exposure to many days and perhaps weeks of rain may impair the health of the field party and will inevitably dampen the morale of individual members. Rain causes delays, makes the midden material soggy and difficult to work, may collapse the trench walls, and brings numerous other major and minor headaches in its wake.

Last spring a group of anthropology students from the University of British Columbia, working under my direction at a site in the Vancouver area, tested the practicability of a simple shelter, designed to give adequate protection during wet weather and to admit sufficient light for all operations.

This shelter, which was erected over the trench to be excavated, consisted of overlapping sheets (3×8 ft.) of thin, translucent Koroseal plastic (.004 gauge), supported in the middle by a rope, stretched at a convenient height over the long axis of the trench, and fastened laterally to two somewhat lower wooden rails, placed parallel to, and a short distance from, the edges of the trench (Fig. 84). The margins of the strips were hemmed. Each of the two narrow ends was provided with three brass grommets for the attachment of strings. By means of the latter, the sheets were secured to the rails.

The shelter proved its usefulness beyond expectations. Even in heavy rain, work continued in perfect dryness, without interruption. Because of the translucency of the plastic material there was always adequate light, and instantaneous photographic exposures were possible whenever they normally would have been. On clear days the shelter provided beautiful diffused light, thus eliminating undesirably strong contrasts of light and shadow.

The shelter stood up well even in a fairly strong wind. Its severest test came during a gale, when two of the hems began to rip. Further damage was averted, however, by furling the strips temporarily and riding out the storm in this fashion. It would probably be an improvement to replace the rather rigid lateral wooden rails with tight ropes which would give somewhat when sudden gusts of wind tear at the sheets.

The durability of this Koroseal plastic appears to be satisfactory in cool to warm temperatures, for our sheets seemed to have lost little of their original strength after three months' exposure to such conditions. The material will deteriorate, however, when exposed to the hot sun for too many days. But this weakness is a minor defect, since, after all, the shelter is intended to serve as an umbrella and not as a parasol. The sheets can be quickly taken down or put up as the need arises. It is possible, however, that other types of plastic can be found which will prove more resistant. In any case, further experiments with similar shelters seem highly desirable. They may well prove a boon to investigators working in areas where heavy precipitation is the rule.

CHARLES E. BORDEN
University of British Columbia
Vancouver, B. C.
August, 1949

## AN UNUSUAL DECORATED STEATITE SLAB FROM NORTHWESTERN CALIFORNIA

The prehistory of northwestern California is yet largely unknown. Any information on archaeological types is therefore of interest. The following note constitutes the description of a unique flat steatite slab upon one of whose surfaces drilled conical pits and holes, together with some incised lines, occur (Fig. 85).

Steatite was locally abundant. Numerous outcrops were worked anciently as evidenced by the large number of prehistoric objects made of this material. Modern Indians know the location of some of these outcrops, and describe the methods of extracting the stone from the mass.[1] For the most part steatite was employed in making grease dishes and bowls.

The specimen described here is in the private collection of Dr. H. H. Stuart of Eureka, and was recovered by him

[3] K. A. Nowotny, "Erläuterungen zum Codex Vindobonensis," *Archiv für Völkerkunde*, Vol. 3, Vienna, 1948.

[4] Translated by Carl Schuster, New York.

[1] R. F. Heizer and A. E. Treganza, "Mines and Quarries of the Indians of California," *California Journal of Mines and Geology*, Vol. 40, pp. 291-359, Sacramento, 1944. (See pp. 306–8.)

FIG. 84. *Top*, front view of Koroseal shelter. *Bottom*, students from the University of British Columbia working under the shelter.

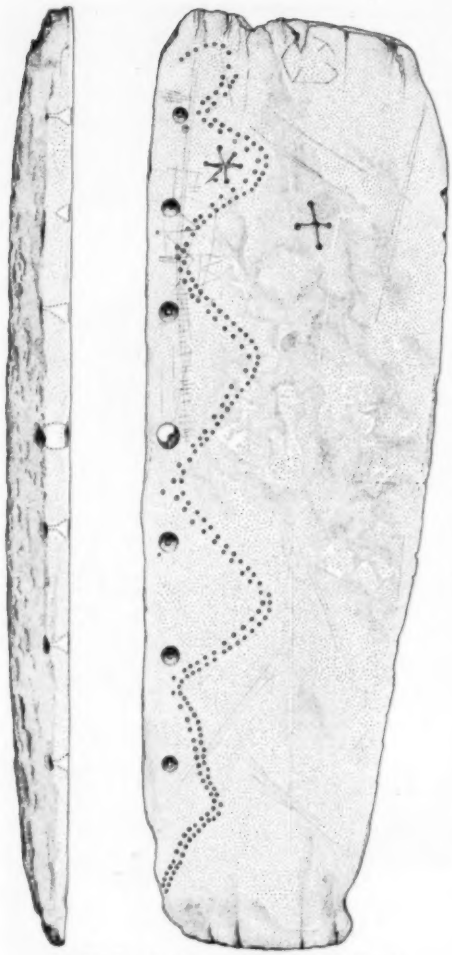

FIG. 85. Steatite slab, northwestern California.

many years ago from the surface of the site of the village of Tsapekw which lies toward the northern end of Stone Lagoon on the ocean shore of Humboldt County.[2]

The slab, of pale green color, is 29 inches long, 12 inches wide at one end, and 7.5 inches wide at the other. The thickness is 1.75 inches. The piece weighs 44.8 pounds. The under side shows tool marks resulting from the maker's efforts to smooth the surface. The tool used was probably of hard stone, and appears to have had a sharpened point about ¼ inch wide. Stone-pecking was usually employed in this region for fashioning stone objects of all sorts. The tool-marked, slightly convex under side has been slightly smoothed, but the gouge marks are plainly visible.

[2] For further details see T. T. Waterman, "Yurok Geography," *University of California Publications in American Archaeology and Ethnology*, Vol. 16, No. 5, Berkeley, 1920. (See Map 31, p. 265.)

The top surface is smooth and highly polished. A few very shallow concavities modify its otherwise absolutely level surface. Whether these irregularities had any purpose, or are simply worn spots which have degraded in softer areas is difficult to tell, but the latter seems more probable.

Along one edge are seven conical holes or deep pits about ¼ inch in diameter. Whether these were drilled with a rotating shaft drill, or with a hand drill held between the thumb and forefingers is impossible to say, though they look like the result of the first-named process. The center hole is not man-made, but is a hole made by a piddock clam, and would indicate that the stone had at one time lain in salt water. If this slab had been picked up on a beach near a steatite outcrop with the piddock clam hole in its edge, the additional six holes may have been made in imitation of the natural hole. The second hole from the left is a pit which was not drilled sufficiently deep to pierce the bottom surface as shown in the section view.

The flat surface of the slab bears a double wavy or zigzag line of conically drilled pits each about 1 inch in diameter and 1 inch deep. Lightly incised zigzag lines are inscribed along the lower edge to the left of the center hole. At two points a constellation of drilled pits have been connected with incised lines to form a four and six spoked "wheel."

The function of the slab is unknown, but A. L. Kroeber has suggested to me that it may have been a device for keeping account of time. The Hupa "calendar stone" described by Goldschmidt[2] shows that inscribed rocks were so employed in northwestern California.

ROBERT F. HEIZER
Department of Anthropology
University of California
Berkeley, California
May, 1949

[2] W. R. Goldschmidt, "A Hupa 'Calendar,'" *American Anthropologist*, n.s., Vol. 42, pp. 176–7, Menasha, 1940.

## AN ANALYSIS AND INTERPRETATION OF THE CERAMIC REMAINS FROM A NUMBER OF SITES IN HORRY COUNTY, SOUTH CAROLINA*

In 1946 and 1947 Dr. C. L. Glenn of Vanderbilt University gathered a collection of sherds from nine sites in the vicinity of Myrtle Beach, Horry County, South Carolina. These sherds were presented to the Smithsonian Institution. Some of the sherds were obtained to the north of Myrtle Beach, others in the immediate vicinity, and still others to the south of the city. The sites consist of small sandy ridges, 20 to 30 feet above mean sea level and overlooking Long Bay.

Dr. Glenn reports that the sites contained ashes, sherds, and a few scattered oyster shells of the "racoon" type, which is the common type found in this vicinity. No bone, antler, or stone material was found in the debris deposit. He states that no local stones are present from which to fashion implements and that the very few which are found are crude and made from imported stones. In the entire collection, only two stone artifacts are included—one projectile point and one scraper.

* Published by permission of the Secretary, Smithsonian Institution

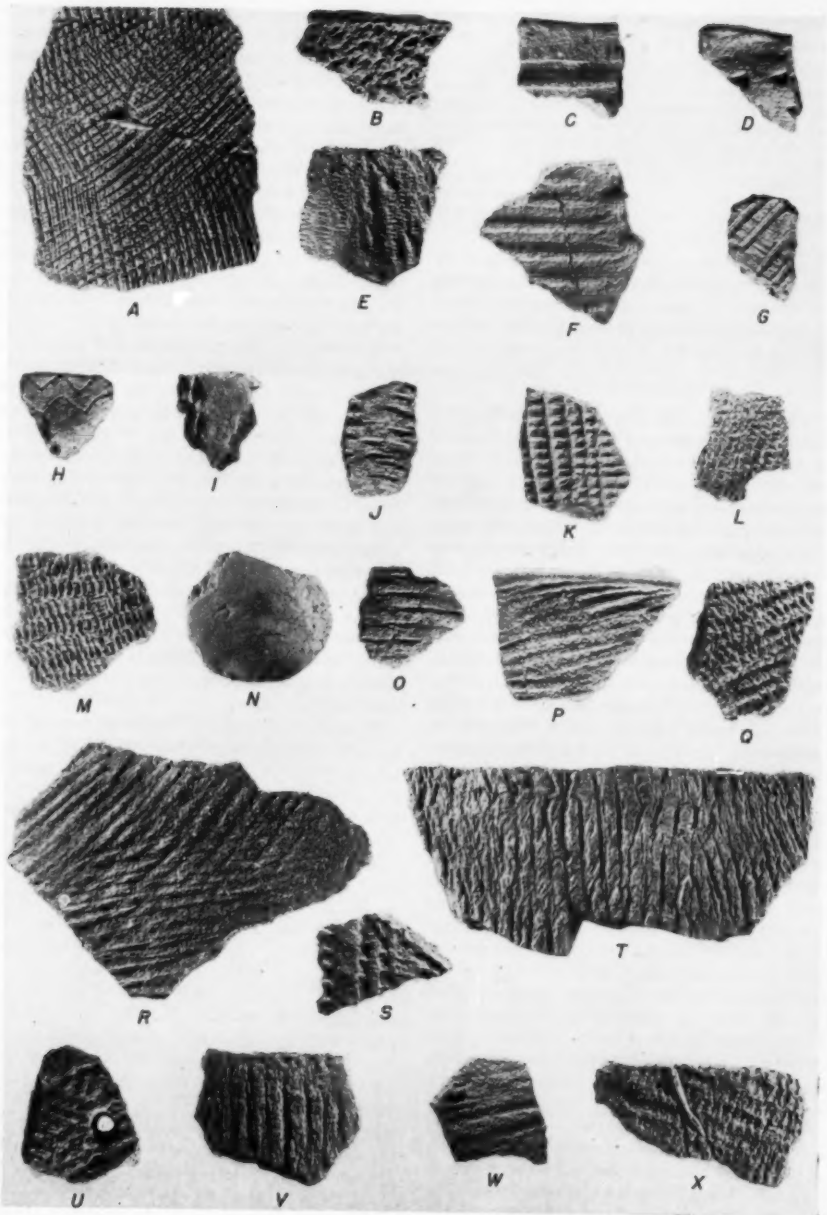


FIG. 86. Potsherds from the vicinity of Myrtle Beach, South Carolina: *A*, *B*, *E*, Site 1; *C*, *D*, *F–J*, Site 2; *K*, *L*, *O*, Site 4; *M*, *N*, Site 3; *P–R*, Site 6; *S*, *U–X*, Site 8; *T*, Site 5.

Speaking about the oysters found within the cultural deposit, Moore[1] states:

> The deposits of oyster-shells, evidence of dwelling sites throughout the territory visited by us along the South Carolina coast, were comparatively insignificant, being mainly confined to shells scattered over fields. It would seem then that the use of the oyster as an article of diet by the coast Indians decreased going northward, since the shell deposits of South Carolina are greatly exceeded by those of Georgia, which, in their turn, yield the palm to the mighty masses of shell along the Florida coast. Whether the restricted use of shellfish for food on the South Carolina coast arose from less bountiful supply of molluscs, a preference for other articles of diet on the part of the aborigines, or a sparse population, we are unable to decide.

A total of 884 sherds are represented from the nine sites (Fig. 55). The greatest number of sherds came from Site 1, with Site 6 producing the next greatest number, followed by Sites 2, 8, 7, 9, 5, 3, and 4.

## DESCRIPTION

Site 1 (38 Ho 1) is located near the southern boundary of Myrtle Beach and very near the sea shore. Scattered sherds and soil discoloration first drew Dr. Glenn's attention to this site. A surface collection was made at the time and it was noted that stone artifacts and chips were lacking. Some probing into the deposit was made, but no actual digging was undertaken. No traits except pottery were noted.

The pottery is composed of a laminated clay, tempered with varying amounts of sand and some vegetal material. This fiber-tempering material consists of very small particles, the longest of which measures around 4 mm. During the firing this material was carbonized by the heat, driving the carbon or smudge into the walls of the vessel to varying depths depending upon the amount present. The sand consists of small quartz particles with rounded edges, characteristic of typical beach sand.

There are faint suggestions that most of the pottery from this site was fashioned by means of the coiling method, with the exception of certain basal sherds which have the appearance of having been modeled. These basal sherds are rounded or subconoidal in cross section. The walls tend to be either vertical or slightly convex with necks either straight or slightly flaring. Mouths are wide. Lips are very simple, either rounded, flattened, or thinned and rounded.

The surfaces have been roughly smoothed. In a number of instances the surfaces present a rather lumpy contorted appearance due to poor smoothing while in the plastic stage. Usually both surfaces have been treated in the same manner. In a few cases some of the interior surfaces have been carefully smoothed and polished, presenting a semi-burnished appearance.

Decoration, as a rule, is applied only on the exterior of the vessel, but in a number, especially where a cord-wrapped paddle has been used, the impression had been carried over into the interior of the vessel as well as covering the lip area. The distance inside to which the design or impression was applied varies from vessel to vessel. One check-stamped sherd shows that the stamp was applied to a portion of the interior and then most of the impression was partly obliterated by subsequent smoothing. As far as is known this was not a usual practice.

Decorative techniques consist of the following: stamping with a cord-wrapped paddle, fabric-impression, check-stamping, complicated stamping, ridge brushing, and simple punctation.

The cord-wrapped paddle was applied so as to form rough diamond-shaped irregular figures, a crisscross of cord impressions. Cord elements vary in diameter from 1 to 3 mm. No attempt will be made to differentiate between the size of the cord elements in this study.

A number of textile types, the impressions of which are to be found on the exterior of sherds, show the versatility of the aboriginal weavers. The majority are impressions of plain, plaited fabric textiles, while a few suggest basketry. The latter were not noted by Holmes,[2] while he attributed the former to various types of nets.

Moore[3] reports finding check-stamped sherds in some of the mounds excavated in coastal South Carolina. A few of this type are in the collection; they resemble vaguely the Deptford series and are more comparable to those described and illustrated from the Thom's Creek site.[4] The longitudinal lands are much broader in comparison to the fine transverse lands. The checks are arranged in either rectangles or diamonds. Ford and Willey[5] have pointed out that there is a possibility that this type may have developed from the previous linear punctation of the Archaic, fiber-tempered pottery of this same region.

The sherds bearing portions of complicated stamped designs are too fragmentary and small to determine the exact type to which they belong. All that can be determined is that the design is rather simple and curvilinear in nature, resembling in a vague sort of way the late prehistoric and early historic types.

Three sherds of a ridge-brushed ware were recovered, all apparently coming from a single vessel. They were possibly brushed with a number of small twigs or stiff grass stems to give a corrugated or "washboard" effect. Slight ridges appear within the deeper grooves; they could possibly be duplicated by using a narrow, flat wooden stick which has seen some wear, in which the soft woody portions are worn away, leaving the annular ring portions protruding. Trailing the stick over the soft clay would produce a double impression—a wide groove containing a number of smaller, slight grooves, both running parallel to the main axis of the stroke.

Site 2 (38 Ho 2) is located 12 miles northeast of Myrtle Beach at Windy Hill. U. S. Highway 17, known locally as King's Highway, cuts through the village site. It was from the road cut that the material for this study was obtained.

Fifty-six sherds and 1 crude projectile point were found on the surface of this site. Of this number, 5 were marked with a cord-wrapped paddle, 12 were fabric-impressed, 1 was random punctated and very similar to the comparable Thom's Creek type, 1 was incised, and 28 were plain.

The only deviation from Site 1 was displayed in the single incised sherd. This came from the body of a vessel which was decorated with two wavy incised lines roughly 5 mm.

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[1] Moore, 1899, p. 165.

[2] Holmes, 1903.

[3] Moore, *ibid.*

[4] Griffin, 1945.

[5] Ford and Willey, 1941, p. 339.

apart. The portion of the design recovered was insufficient to place it in any known category.

The projectile point, measuring 5 cm. in length, 3 cm. in width, and 1.4 cm. at its thickest portion, was crudely fashioned from a very fine, composite sandstone.

Site 3 (38 Ho 3) is located 11 miles north of Myrtle Beach on the road toward Ocean Drive Beach. No outstanding types are noted for this site; it follows fairly closely the general ceramic pattern outlined for Site 1. Twenty-eight sherds were recovered: 11 were marked with a cord-wrapped paddle, 5 were fabric impressed, 1 was check stamped, and 8 were plain.

Site 4 (38 Ho 4) is located 13 miles north of Myrtle Beach along the intracoastal canal at the Yacht Basin. This site introduced a new type of pottery not identified in any of the preceding sites—simple stamped. Although only 2 sherds were present, they represent 8.3% of the total number recovered.

Indications of aboriginal occupancy was noted in the vicinity of the Old Marl Plant in Myrtle Beach, which is here designated Site 5 (38 Ho 5). All of the sherds recovered, 30 in number, were of the cord-wrapped-paddle variety; it is not known if this is the only type present or whether just this one variety was gathered from the surface.

Site 6 (38 Ho 6) is located on the west side of U. S. Highway 17, just south of a small slough at Murrell's Inlet. This site is essentially a simple-stamped site, in that 149 out of 183 sherds are of this type. The remaining 34 are divided thus: 9 fabric impressed, 14 plain, 5 complicated stamped, and 6 indeterminate, since they are badly weathered. The simple-stamped ware displays certain laminated features not noted in any of the other wares from this general area. The only thing we can tell about the complicated stamped sherds is that the design is curvilinear and rather simple in execution.

Site 7 (38 Ho 7) lies on the south side of Myrtle Beach on U. S. Highway 17. The highway cuts through a portion of the site and it was from this area that Dr. Glenn collected 48 sherds, which practically duplicate the record of Site 3 in that the greater number of the sherds are of the cord-wrapped-paddle type.

Site 8 (38 Ho 8) lies within the confines of Myrtle Beach proper. This site was found while investigating along a newly dug ditch for a water pipe to be installed in a summer cottage within the city. It seems that the workmen trenched the deposit, little realizing that they were going through an old village site. Just how deeply the deposit extended is not known nor is the exact location within the deposit from which the sherds came. Whether the sherds are representative of the complete ceramic picture of the site is unknown. Those that were recovered resemble the collection from Site 3, with the exception that a single simple-stamped sherd was present.

Site 9 (38 Ho 9) is in Ocean Drive Beach and resembles Site 7. Only two types were present: cord-wrapped paddle and plain ware.

### ANALYSIS

The paste of the pottery is quite homogeneous, in that all sherds are basically sand-tempered. The amount and texture vary from piece to piece and from site to site. There is slight evidence that some vegetal tempering matter was used; perhaps this is incidental to the true tempering material incorporated in the clay. The vegetal matter appears as very small particles, which were thoroughly carbonized when the vessel was fired.

The color of the pottery, basically a local determinant, ranges from a deep brick red to a dull gray with shades of color ranging in between these two extremes. With the exception of one sherd, which comes from a small saucer-like vessel, all of the others are from wide-mouthed jars with either straight or slightly globular sides and with rounded or slightly conical bottoms. A number of different surface treatments are displayed in the collection, the most numerous of which are marking with a cord-wrapped paddle, followed by fabric impression, complicated stamping, ridge brushing, punctation, and finally incision. Arranged as percentages, these run: marking with a cord-wrapped paddle,

TABLE 38. DISTRIBUTION OF SURFACE TREATMENT ON HORRY COUNTY POTSHERDS

| | *Site 39 Ho 1* | *Site 39 Ho 2* | *Site 39 Ho 3* | *Site 39 Ho 4* | *Site 39 Ho 5* | *Site 39 Ho 6* | *Site 39 Ho 7* | *Site 39 Ho 8* | *Site 39 Ho 9* | *Total Numbers and Percentages of Types in Study* |
|---|---|---|---|---|---|---|---|---|---|---|
| Cord-wrapped paddle | 232 ( 57.7) | 5 ( 8.9) | 11 ( 39.3) | 3 ( 12.5) | 30 (100.0) | | 42 ( 87.5) | 37 ( 71.2) | 24 ( 77.4) | 404 ( 45.8) |
| Fabric impressed | 110 ( 27.4) | 12 ( 21.4) | 5 ( 17.8) | 13 ( 54.1) | | 9 ( 4.9) | | 11 ( 21.2) | | 160 ( 18.2) |
| Check stamped | 20 ( 5.0) | | 1 ( 3.6) | | | | | 1 ( 1.9) | | 22 ( 2.5) |
| Plain | 30 ( 7.4) | 28 ( 50.0) | 8 ( 28.6) | 1 ( 4.2) | | 14 ( 7.7) | 6 ( 12.5) | 2 ( 3.8) | 6 ( 19.4) | 95 ( 10.7) |
| Complicated stamped | 1 ( 0.3) | | | | | 5 ( 2.7) | | | | 6 ( 0.7) |
| Ridge brushed | 3 ( 0.7) | | | | | | | | | 3 ( 0.3) |
| Punctated | 1 ( 0.3) | 1 ( 1.8) | | | | | | | | 2 ( 0.2) |
| Brushed | | 9 ( 16.1) | | 1 ( 4.2) | | | | | | 10 ( 1.9) |
| Incised | | 1 ( 1.8) | | | | | | | | 1 ( 0.2) |
| Simple stamped | | | | 2 ( 8.3) | | 149 ( 81.4) | | 1 ( 1.9) | | 152 ( 17.3) |
| Indeterminate | 5 ( 1.2) | | 3 ( 10.7) | 4 ( 16.7) | | 6 ( 3.3) | | | 1 ( 3.2) | 19 ( 2.2) |
| Totals | 402 (100.0) | 56 (100.0) | 28 (100.0) | 24 (100.0) | 30 (100.0) | 183 (100.0) | 48 (100.0) | 52 (100.0) | 31 (100.0) | 884 (100.0) |

45.8 per cent; fabric impression, 18.2 per cent; simple stamping, 17.3 per cent; plain, 10.7 per cent; check stamping, 2.5 per cent; brushing, 1.9 per cent; complicated stamping, 0.7 per cent; ridge brushing, 0.3 per cent; punctation, 0.2 per cent; and incision, 0.2 per cent (Fig. 86).

By reviewing Table 38 it will be seen that Sites 1, 3, and 4 follow this general pattern fairly closely. Site 2 emphasizes plain ware. Site 5 is either a pure site or else only one type of sherds was gathered from the site; until more information is forthcoming, it cannot definitely be treated as either. In Site 6, simple stamping far outnumbers all others. Sites 7, 8, and 9 are essentially cord-wrapped paddle sites.

A number of simple-stamped sherds from Site 6 exhibit a characteristic heretofore not noticed. These sherds split into either even or uneven vertical sections. The factors bringing about this cleavage are not known, for apparently this ware was fashioned by means of coiling. The characteristic is only present at the one site and may be a diagnostic trait of the simple stamped type.

## SUMMARY AND CONCLUSIONS

The section of South Carolina under discussion is the former home of the Waccamaw, a member of the Eastern Siouan group. The Waccamaw lived on the Waccamaw and Lower Pedee rivers and are said to have been semi-nomadic. They subsisted largely by hunting and occupied dome-shaped houses made of bark. Agriculture, though secondary, was of considerable importance, as specified by Milling.[6]

Consulting the *Handbook of the American Indians*,[7] we find this account of the Waccamaw:

> One of the small tribes formerly dwelling on the Lower Pedee and its branches in South Carolina and the adjacent border of North Carolina. Nothing is known of their language, and very little else concerning them, as they were never very prominent in history. Their habitat was along the Waccamaw river which enters the Pedee from the north almost at its mouth. They were first mentioned in 1715 as living nerar the Winyaw, both tribes receiving ammunition from the Cheraw, who attempted to gain them as allies of the Yamasee and other tribes against the English. At this time they were living in 6 villages with a population of 610 (Rivers, Hist. S. Car., 1874). In 1755 the Cherokee and Notchee were reported to have killed some Pedee and Waccamaw in the white settlements (Greg Hist. of Old Cheraws, 15, 1867). Like the Pedee, Cheraw, and other tribes of that region (Mooney, Siouan Tribes of the East, 76, 1894), the remnant was probably finally incorporated with the Catawba.

Moore,[8] during his investigations of the mounds along the coast of South Carolina, recovered a similar collection of sherds, but states that, "On the whole it would seem probably the South Carolina coast has little to offer from an archaeological standpoint." This statement is based on the facts that very little spectacular material was recovered, and that what was found was meager and hard to get.

Stirling, in 1935, turned over to the United States National Museum a collection of material gathered from a village deposit located along U. S. Highway 17, 4 miles south of the junction of U. S. Highway 17 with a side road which leads to Ocean Drive Beach. Plain ware predominates in the collection. Included within the group are a number of punctated, incised, and cord-wrapped-paddle sherds. These, together with fragments of glass bottles, chinaware, an iron spoon handle, three crudely shaped and chipped stone projectile points, and a fragment of a trade pipe of white man's manufacture, constitute the collection. All were attributed by Stirling to the Waccamaw Indians.

Holmes[9] states that North Carolina furnished some stamped ware, while in South Carolina stamped ware appears to be the prevailing variety.

Griffin,[10] in studying the pottery remains from the Thom's Creek site in Lexington County, South Carolina, found that stamped wares predominated, especially of the Deptford type, with plain surfaced and punctated types equal in number. All of the pottery from this site belongs to the early Woodland tradition of the Southeast with the exception of a few complicated stamped sherds, which date from the protohistoric and early historic periods in the Georgia-South Carolina area.

All of the nine sites under discussion can be grouped into a common lot, in that they all contain basically the same pottery types, the same tempering material, and the same vessel forms. Whether or not these wares can be attributed to the Waccamaw Indians cannot be stated with any assurance; additional study of the general area must be attempted and actual tests made at the sites before any positive statement can be made. Insofar as a few types, such as the punctate, resemble those described from Thom's Creek, the relative chronological position of the material may be placed immediately following a late Deptford period. The few complicated stamped sherds *may* indicate, as Griffin has pointed out, a protohistoric or early historic occupancy. Since no trade material was included in the collection, it probably represents a phase of occupation which preceded the white man's intrusion into the area.

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April, 1949


[6] Milling, 1940.
[7] Hodge, 1910, p. 887.
[8] Moore, *ibid.*
[9] Holmes, 1903.
[10] Griffin, 1945.

# BOOK REVIEWS

*The George C. Davis Site, Cherokee County, Texas.* H. PERRY NEWELL and ALEX D. KRIEGER. With an appendix, "Maize from the Davis Site: Its Nature and Interpretation," by VOLNEY H. JONES. Memoirs of the Society for American Archaeology, No. 5. Menasha, 1949. xv+253 pp., 66 figs., 20 tables.

This report on the Davis site, located near the Neches River in central East Texas, is a thorough description of excavations conducted by a W.P.A.-University of Texas project in 1939–41 and an analysis of artifactual material that in many aspects provides a model for future reports. It contains in addition a definition of the Alto Focus and the most comprehensive statement yet in print on the nature and relationships of the Gibson Aspect, the earlier of the two time periods now established for the Caddoan area.

The first part of the report, the work of the late H. Perry Newell, explodes the notion that the site marked the location of a Spanish mission to the Neches Indians and describes the site, its location, and the features encountered. Only a portion of a roughly L-shaped mound, forming one of a group of three mounds, and a sample of the village area were excavated. Houses were found in the village area, which also extended below the mound, and on the top of a platform that formed one of the major building stages of the mound. Newell demonstrates that the method of construction utilized is similar to that used by the historic Tejas. During building, a large center post or tree served as an aid in pulling down the tops of the wall posts to form a "bee-hive"-shaped structure. The center post was then cut or burned off. This technique is confirmed by the fact that the mold of the large center post often had an oval fireplace superimposed upon it and this was not penetrated by the post. The houses are assigned to the earlier two of the three sequent phases established at the site. Those definitely attributed to the first phase are predominantly round in outline, the only variant being an oval structure. Houses attributed to the second phase are not only round in outline but some are square with rounded corners. Houses generally have no definite entrance, gaps in the posthole pattern being the only indications of doorways.

Two features are listed as possible exceptions to the general absence of definite entrances. One of these, Feature 9, a house with a rounded square outline attributed to Phase 2, had a gap in the post pattern to which was attached two parallel trenches spaced about 2 feet apart and containing no post molds. The doubt which is raised as to whether this was an entrance hardly seems justified in view of the presence of parallel trenches indicating entrances in the Spiro Focus,[1] which is considered by Krieger to be contemporary with Alto Phase 2, the Alto Focus being the classificatory unit into which the three phases of the Davis Site are grouped. A further parallel between the houses of the two foci, to be seen in Feature 9, is a rounded buttress at the edge of the house, which is also found in a few Spiro Focus houses. A second structure, Feature 35, also mentioned as having a possible entrance, is described as a ceremonial "maze." Here again, what appear to be two superimposed pairs of entrance trenches, in this instance with post molds, are not definitely interpreted as such because the uniformity of the whole pattern makes it appear to be a single unit. To the reviewer, an equally logical alternative explanation which deserves further consideration is that some sections of the wall of an earlier structure were used in the construction of a second, later house. It should be mentioned that Krieger's table on house structure definitely lists these houses as having an entrance, which would appear to indicate less skepticism in regard to the features representing entrances than is implied in Newell's description.

The three sequent phases of the site are established by Krieger through an analysis of the cultural remains and a plotting of this material in terms of the construction zones of the mound. Since no burials were found, the culture complex, aside from houses, is largely limited to artifactual material dominated by pottery, other forms being relatively scarce. The manner in which the pottery was treated deserves mention. Though some 96,000 sherds were recovered in the excavation, by the elimination of body sherds and other small fragments lacking diagnostic features, the number subjected to analysis was reduced to 11,840 sherds. This was further decreased to an estimated 5,031 vessels through a grouping of sherds thought to belong to the same vessel. This number was thought to provide a more reliable base for statistics than the total sherd count, which is distorted by such factors as the number of pieces into which a vessel happens to break. Phase changes consist primarily of changes in frequency indicating increasing or decreasing popularity of pottery types with only a few new types appearing in later phases. Since the ceramic material consists primarily of sherds that are accidentally included in the mound fill, it is probably only the appearance of new types that can be established with reasonable certainty. Changing frequencies are certainly affected by the selection of the area and depth of the village midden material used as mound fill. This is admitted, for Krieger frequently mentions that earlier material can be carried upward in the mound fill.

The interpretation of the phase sequence is in turn based in part upon the nature of ceramic material considered to be trade sherds and those indigenous vessels felt to be influenced by foreign ceramic traditions. Phase 1 locations contain most of the vessels of a sandy ware having strong resemblances to Mandeville Plain of the Tchefuncte culture and to Alexander Incised and O'Neal Plain of the Pickwick Basin, while only a few of these sherds were found in Phase 2 and 3 locations. The latter are considered to have been carried upward in the mound fill. Trade sherds of Marksville, Coles Creek, and probably also Troyville, Haley Focus, Spiro Focus, and Sanders Focus affiliations, in a total of but 39 sherds assigned to phase locations, are found primarily in Phase 2 and 3 locations. At the same time that the marked changes in trade types are indicated, most resident pottery types tend to be found with but minor changes in all three of the phases. This would appear to suggest a remarkable stability on the part of the resident pottery types

[1] Kenneth G. Orr, "Field Report on Excavation of Indian Villages in the Vicinity of the Spiro Mound," *The Oklahoma Prehistorian*, Vol. 2, No. 2, pp. 8–15, Norman, 1939.

in the face of markedly changing types in adjacent areas. It is in such areas of the study that a check on the sequence of types would be advisable, as would further checks on the identification of the foreign wares. For example, Krieger has described a group of sherds as possibly Marksville Incised though neither Dr. James B. Griffin nor George I. Quimby, Jr. will claim the material as such (see footnote, p. 133). The sherds seem quite close to one of the pottery types of the Fourche Maline Focus in eastern Ojlahoma, for which unfortunately few illustrations are available in published form.[2] Though Krieger's suggestion that the pottery type may be derived from an outlying Marksville settlement may be correct, it is also possible that the Fourche Maline Focus or a similar complex is the ultimate source of the pottery type with consequently different temporal implications.

Despite the above comments, it should be stressed that one of the important contributions of the publication is to be found in the careful ceramic analysis. The treatment of the pottery not only clarifies the local Texas material but much of that of the adjacent area as well. Some types such as Crockett Curvilinear Incised, for example, give us precise categories for a variety that had been previously grouped with other diverse forms as the Spiro 5 type,[3] an improvement in both clarity and nomenclature. In his discussion of the Spiro Focus material, Krieger has directed attention toward a major difficulty involved in comparative studies, in that much important archaeological work is still known only through preliminary reports which are often difficult to evaluate. Krieger uses the term Spiro Focus only in reference to the Spiro Middle Component, segregating both the Early and Late Components, though Orr has interpreted these as a cultural continuum,[4] much as Krieger regards his Phases 1 through 3 which constitute the Alto Focus. It would appear from Orr's discussion that all of the vessels from the Craig (Spiro) mound attributed to the Early Component are either Coles Creek types or pottery strongly influenced by that tradition. Krieger's suggestion that the material represents a pre-Spiro Focus period does not appear to give adequate consideration to the possibility that the pottery may simply represent trade vessels. Such a situation appears to be the case with another of the Spiro Focus sites, the Brackett site in Cherokee County, Oklahoma, where a French Fork Incised vessel appears to be associated with a Spiro Middle Component.[5] Further realignments will undoubtedly appear following new analyses and it may be particularly interesting when data are obtained both on a Gahagan Focus village component and an Alto Focus burial component.

Krieger's comparative statements are not confined to local cultures such as the Spiro Focus but range far afield and include an extensive discussion of Middle American relationships. It is in pointing out that the Middle American influences must come at an early time level when monochrome polished ware and engraved and incised decoration was popular, that Krieger is led to the conclusion that Phase 1 of the Alto Focus must date around 500 A.D., if not earlier. In the relationships of the phases to the sequences of the eastern United States, Krieger presents several alternatives—principally that the phases spread over both Burial Mound II and Temple Mound I periods, or that they are to be compressed into the latter period, giving the impression that the former is to be preferred. Whether this will be generally agreed upon or not, the provocative suggestions are bound to stimulate thinking and discussion, which is probably the objective toward which Krieger has been working.

In an appendix, Volney H. Jones analyzes the corn remains from the site, determining that they resemble Northern Flint corn and thus fit in the Eastern Complex, which is derived from Guatemala. Such a conclusion is interesting in view of Krieger's comments on the similarity of some Alto Focus ceramics and that of the Miraflores Phase in Highland Guatemala. Jones feels that 700 A.D. would be a conservative date for the introduction of this type corn into Texas and that at present the Alto Focus can be considered one of the earlier recipients of this trait. The discussion of corn in the eastern United States is of considerable aid in clarifying this complex problem.

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[2] See, for example, Phil J. Newkumet, "Preliminary Report on Excavation of the Williams Mound, LeFlore County, Oklahoma," *The Oklahoma Prehistorian*, Vol. 3, No. 2, pp. 2–10, Norman, 1940, Pls. 3 and 3A.

[3] Kenneth G. Orr, "The Archaeological Situation at Spiro, Oklahoma; A Preliminary Report," AMERICAN ANTIQUITY, Vol. 11, No. 4, 1946, p. 237.

[4] *Ibid.*, p. 230.

[5] Lynn E. Howard, "Preliminary Report on Cherokee County, Oklahoma Archaeology," *The Oklahoma Prehistorian*, Vol. 3, No. 1, pp. 2–9, Norman, 1940.

*Californian Shell Artifacts*. E. W. GIFFORD. With an appendix, "Additional Bone Artifacts," by PHIL C. ORR. University of California, Anthropological Records, Vol. 9, No. 1. Berkeley and Los Angeles, 1947. iv+132 pp., tables, illustrations, and bibliography. $2.00.

This work is a monumental one in ethnoconchology and in the archaeological literature of California. Gifford has handled over one-third of a million archaeological shell specimens (398,095 to be exact) from California, and has placed them in 828 empirical types (forms) which were further allocated into 51 orders. A helpful index to the orders is given. The tubing of one species of annelid worm was used. Identified marine mollusk shells utilized by California aboriginals were: tooth-shells, 1 genus, 2 species; pelecypods, 14 genera, 15 species; and, gastropods, 31 genera, 45 species. The molluscan marine total is, therefore, 46 genera and 63 species. Two genera (with 1 species each) of freshwater clams were also used. No freshwater or land snails are reported to have been used archaeologically, although some of the former were utilized ethnologically. Two species of marine shells came from the Gulf of California. All others were from the coast of California.

That abalone shell (genus *Haliotis*) was numerically the favorite California type for artifacts would seem apparent as 34 of the 51 artificial orders contain *Haliotis*, and 28 of those 34 orders are exclusively for *Haliotis*. However, in the 28 separate orders for *Haliotis*, the number of artifacts was 15,481—a small part of the total of 398,095 archaeo-

logical specimens. The manufactory specialization accounting for the diversity of form in *Haliotis* objects (mostly non-functional) may be attributed to gathering accessibility and abundance of this large edible limpet on the rocky seashores of California. Abalone shell is very easy to shape and drill; it provides lustre and beauty where many other shell species are comparatively drab.

Proof of value of any artificial typology, biological key, or any checklist is in its usability. *Californian Shell Artifacts* contains many elements common to all three of those classifactory systems and is thoroughly usable—after one has become familiar with its arrangement and format. Gifford has presented his material as a means to an end, and not an end in itself. The work includes only those shell artifacts accessioned in the University of California Museum of Anthropology before September of 1941. Thus the shell artifacts from the extensive J. B. Lillard archaeological collections of Sacramento Junior College were not included, although transferred to the University of California Museum of Anthropology in the spring of 1942. Mr. Gifford's system is an expandible one, should future need call for an ideal assembling of data on all known shell artifacts from California.

Particularly valuable to both the archaeologist and the conchologist are the genera and species identifications of the artifact shell material, made whenever possible. These determinations were overseen by competent Pacific Coast conchologists. Over 700 of the 828 artifact forms are illustrated by excellent line drawings. Those not illustrated are adequately described. In the descriptions many malacological terms are employed; however, they are not too detailed. Many descriptive terms for generalized shape are quite good and mnemonic: harp, dorsal-fin, leg-of-mutton, boot, dumbbell, sausage, etc. Of interest to conchologists and those interested in ethnoconchology, would have been either a systematic, a geographic-range, or an alphabetized list of molluscan species utilized by the California Indians who made the forms recorded in *Californian Shell Artifacts*.

Over 150 sites are listed and geographically located, most of which are to be found on the maps in Gifford's *Californian Bone Artifacts* (University of California Anthropological Records, Vol. 3, No. 2, 1940). Local names for sites in the Sacramento Junior College–University of California surveys of the 1930's are given.

Ethnological occurrences of archaeological types of shell artifacts are noted, and exclusively ethnological types in California are discussed. Some of these are illustrated. Interesting observations are recorded as to ethnologic methods of manufacturing shell artifacts.

Gifford divided California into eight archaeological areas for the purpose of comparing his shell and bone artifact forms. A comparative method for studying shared and unshared forms is used in the tables and discussion in contrast to the usual stratigraphic method of examining recurrent associations of finds *versus* merging culture areas. Seemingly, as complete a picture as possible is given regarding assumptive temporal relations of many of the bone and shell artifact forms. It will be interesting to see whether Gifford's combinations of forms eventually prove to be cultural types, or those diagnostic of foci.

Some previously unpublished data on shell artifact forms and occurrences of species in the Southwest are valuable for evidences of trade. It is noted that the *Glycymeris*-type bracelet form is exclusively Southwestern, although California Indians had access to many species of large pelecypods. Several *Glycymeris* bracelets recorded from southern California have proven to be Hohokam. The species of marine shells used in the Southwest for ornaments were mostly from the Gulf of California, and thus Californian influence in form is usually lacking.

The appendix by Mr. Orr lists and describes bone artifacts in the Santa Barbara Museum of Natural History from nearly 30 southern California sites. Some orders and empirical forms are proposed which were not included in Gifford's *Californian Bone Artifacts* (1940). Orders previously proposed by Gifford are designated as such by placing his name after them, a procedure which is reminiscent of the system used in biological bionominal nomenclature. Ninety-eight bone artifacts are illustrated by excellent drawings. Of the 35 orders of bone artifacts listed, 15 are newly established by Mr. Orr. His appendix is purely descriptive; no interpretation is presented.

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*Man in the Primitive World, an Introduction to Anthropology*. E. ADAMSON HOEBEL. New York: McGraw-Hill Book Co., Inc. 1949. xii+543 pages, 73 text figs., glossary, bibliography, and index. $5.00.

Professor Hoebel has provided students with a clear and concise text, written in an easy, informal style. Its general proportions and level of exposition should make it a useful and stimulating text for a one semester introductory course.

The organization of the volume places major emphasis on cultural anthropology. Following a general introduction, there are sections on Ancient Man and Prehistoric Culture (60 pages covering the most essential material on fossil man and Old World archaeology) and Race and Culture (26 pages on racial differences and classification). Linguistics is omitted from detailed consideration. The remainder of the volume falls into two major parts: Primitive Society and Society and Culture.

Primitive Society is discussed in 22 chapters organized in sections on Subsistence and Crafts, Marriage and Kin, Status and Social Role, Property, Social Control, and Religion. The chapters on Marriage and Kin are especially good. In this reviewer's opinion, they are unsurpassed by any equivalent text. Dr. Hoebel's specialization in the field of primitive law is apparent in the quality of the discussion of Social Control. He does not, however, allow his interest in the subject to unbalance the book by a disproportionately lengthy discussion.

The concluding section on theory and cultural process consists of a relatively brief consideration of the culture area concept, culture systems, personality and culture, invention and diffusion, and cultural evolution. The inclusion of the more recent theoretical developments is commendable.

Hoebel, who himself has done archaeological work, specifically recognizes the difficulties of those whose sources of data are primarily objects of material culture—"the tangible remnants of the intangible reality." There is little doubt that a sound grounding in cultural anthropology can contribute both caution and insight to the archaeologist in his attempt to reconstruct that reality. This text can help train such archaeologists.

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*Art and Life in Ancient Mexico.* COTTIE A. BURLAND. Oxford: Bruno Cassier, 1949.

Esta pequeña obra no pretende ser un trabajo técnico; al parecer las intenciones del autor son dar a conocer en forma popular, concisa y breve a los lectores de habla inglesa el arte y la vida en el antiguo México. La obra abarca los aspectos más importantes y salientes del México prehispánico, incluyendo las culturas que alcanzaron mayor desarrollo, pero dándole mayor espacio a las más recientes, que conocemos mejor y sobre las que tenemos más ámplia información, tales como la de los aztecas.

Dado el caracter semi-popular de este trabajo no puede exigírsele una rigurosa exactitud técnica, de acuerdo con las investigaciones más recientes máxime cuando muchas de ellas no han sido publicadas, por lo que al autor de este trabajo no podía estar al tanto. Sin embargo, se observa que el autor, C. A. Burland, se documentó debidamente a través de las publicaciones más recientes y renombradas a la vez que quizá estuvo en comunicación personal con algunos investigadores de quienes obtuvo datos acerca de la arqueología de México.

Como se ha dicho, existen algunas discrepancias e inexactitudes de poca importancia que no son de gran trascendencia; pero sería conveniente, en caso de una nueva edición, hacer las rectificaciones necesarias. Así, por ejemplo, enumerando las discrepancias más notables, tenemos la afirmación de que la actual catedral cristiana fue construída sobre el antiguo templo de Huichilopochtli, que es inexacta porque el antiguo templo mayor de Tenochtitlán se halla a alguna distancia de la catedral y justamente en la unión de las calzadas que irradeaban de Tenochtitlán hacia los distintos puntos cardinales.

La afirmación de que la verdadera rueda fue conocida por los antiguos mexicanos y que esto ocurrió en Teotihuacán en donde se ha encontrado con pequeños juguetes, tampoco debe tomarse al pie de la letra. Este hallazgo, contrariamente a lo informado, fue hecho en la región Huaxteca donde hay indicios de este elemento, pero no en Teotihuacán. Que los Totonacas fueron los constructores de la pirámide del Tajín, cerca de Papantla, es otra affirmación del autor de esta obra que no se ha podido comprobar según las últimas investigaciones. Este monumento parece ser obra de culturas anteriores.

No necesito seguir enumerando otra serie de datos de menor cuantía consignados por este autor que no estan de acuerdo con la última palabra sobre la arqueología de México. Fuera de estos detalles la obra llena bien su cometido.

Efectivamente, *Art and Life in Ancient Mexico* es de excelente presentación en magnífico papel y magníficas fotografías, muchas de las cuales son de objetos que se encuentran en el Museo Británico de Lóndres, circunstancia que hace esta obra también útil para toda clase de investigadores puesto que da a conocer ejemplares que no han sido suficientemente publicados. La obra está integrada por 98 páginas de texto con numerosas y apropiadas fotografías y 2 cortos apéndices anexos acerca de la escritura y sistema calendárico.

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*Excavations at Zacualpa, Guatemala.* ROBERT WAUCHOPE. Based on field work for the Carnegie Institution of Washington. Middle American Research Institute, Tulane University of Louisiana, Publication No. 14. New Orleans, 1948. 168 pp., 2 appendices, 25 pls., 78 figs., 2 maps.

Section I of this monograph consists of an anthropological interpretation of its conclusions presented for the use of non-archaeologists in a pattern based on Chapple and Coon's *Principles of Anthropology*. Section II is a historical reconstruction of the site and its place in Guatemala prehistory, based on archaeological work, native annals, and early historic references. It includes a discussion of calendar correlation and is designed to give historical background to Section I and to serve archaeologists who do not want the detail of the usual site report. Section III is a two-page listing of related archaeological material (pottery) by areas for each Zacualpa period, and Section IV is a three-page statement of conclusions.

The remaining 116 pages of text comprise the archaeological report in the form of appendices, Appendix A being The Site and Excavations by Wauchope, Appendix B, The Pottery in collaboration with Edith Bayles Ricketson, and Appendix C, The Artifacts, a catalogue of manos, metates, and obsidian blades and knives by A. V. Kidder.

The site of Zacualpa in eastern Quiché consists of three groups of ruins lying about two kilometers east of the modern town in the valley of the Río de la Vega, which flows east and south to empty into the Río Grande, a tributary of the Motagua. The largest group of ruins, A, was tested for pottery debris with trenches which uncovered an early stone-cist cemetery. The next largest, B, was sampled by surface collecting. C, a group of several long low rectangular mounds around a small plaza, was chosen for excavation because in its terrace tombs had been found by Father Rossbach in 1933. A search for these tombs by S. K. Lothrop and Father Rossbach in 1932 and subsequent publication of available tomb and related material by Lothrop in 1936 drew attention to the site and led to Wauchope's working there in 1935–36. Although the war delayed publication of his book until 1948, it stands as written in 1942. A report on further work at Zacualpa in 1947 and on the comparative literature since 1942 will follow.

Mounds C-I, II, and III enclosed three sides of a 25 by 20 meter court. Construction on each mound started in approximately the same way, with people living presumably in small huts on a cleared surface. Next they built one or

two small platforms, and enlarged or built over them during the following two or three periods, continuing throughout to excavate basin- and bowl-shaped pits in their platform floors. Mound C-I always had small rooms in conjunction with its platform expansion. Mound C-III, at one time, if not always, a substructure for a dwelling, included a tomb, reused in prehistoric times and rifled in recent, and stone and clay drainage gutters. Building ceased at the end of the Tohil (Plumbate) Phase, but in the succeeding Yaqui Phase jars with cremations were set into all these mounds.

Superstructures probably had wooden framing, some sort of wattle-and-daub walls, and thatched roofing. The mounds also took the utmost advantage of materials at hand: retaining walls of local stone had a fill of hard adobe earth and usually a facing of the same. Floors were made of the same clay, tempered with bits of grass, pine needles, or pumice, and were either sun- or fire-hardened. The soil of La Vega Valley apparently provided a stratigrapher's as well as a builder's dream for "the stratified drift layers . . . sloped downward and outward from the retaining walls. Each was capped with a thin layer of dark, hard-packed clay."

The prehistoric occupation of Zacualpa is divided on the basis of pottery into four phases: Balam, Pokom, Tohil, and Yaqui. Balam pottery antedates Group C and comes from the bottom strata of Group A cemetery trenches. It is tentatively dated 8:14:0:0:0 to 9:10:0:0:0 in the Maya Long Count and its closest relations are with Alta Verapaz material excavated by Burkitt and published by the reviewer. Wauchope finds at Zacualpa what I found at Chamá in Burkitt's material and in an early deep tomb as yet unpublished that I dug in 1940. The earliest period at both sites contains vessel types characteristic at other sites of the end of an early period and the beginning of a later. The other sites include Uaxactun, San José, Holmul, Kaminaljuyu, Monte Alban, and Teotihuacan. If their range were less, any historical significance for period definition might be clearer. It is interesting that Chamá and Zacualpa are within easy reach of each other, since a tributary of the Chixoy River on which the first site is located starts within seven kilometers of the second. It must, however, be remembered that the early material from both sites is chiefly funeral furniture, where a hold-over of early vessels is perhaps more to be expected than in everyday debris.

Pokom Phase, 9:10:0:0:0 to 10:8:0:0:0, probably grows out of Balam and is closest in resemblance to Tepeu, San-Jose III–IV, and Benque Viejo III and IV. Group C construction, which provides the scanty Pokom sherd material, seems to have started in the latter part of the period. This pre-Plumbate horizon is, according to Wauchope, more fully represented in Chixoy II in the Alta Verapaz where it contains several traits that do not appear at Zacualpa until the following Tohil Phase. This would seem to support the Quiché tradition which tells that their people came from the north, first to the Verapaz, then centuries later to Utatlan near Zacualpa, a region still Quiché-speaking. Pokom is considered a pre-Quiché or early Quiché Phase.

Tohil Phase, 10:8:0:0:0 to 10:19:0:0:0 or 11:1:0:0:0 is marked by the sudden appearance of Plumbate, Thin Orange, and animal head effigy supports, but is very clearly a gradual outgrowth from Pokom. Resemblance is still close to Chixoy pottery and to vessels as far away as Oaxaca, but no longer close to that from Classic Maya sites like Uaxactun and San José. It is the time of greatest building activity at Zacualpa and of small stone tombs. Tohil is taken to be the period of Quiché cultural and later political domination since the end of it may well mark the reign of Quicab, Quiché king whose conquest of the site is recorded by the *Popol Vuh*.

Yaqui Phase is identified only by the cremation jar burials set intrusively into Group C mounds. Since no building activity is associated with it and cremation is taken to be typically late and Mexican, the Yaqui phase may mark use of the site by Tlaxcalan troops, who came with Alvarado and who may have moved the inhabitants to the modern site of Zacualpa, a Quiché-speaking town with a Nahuatl name. While this is an intriguing and plausible interpretation of the archaeological sequence, Wauchope points out that Yaqui may instead mark Quicab's conquest. In either case, the evidence from Zacualpa seems to support an 11:3:0:0:0 correlation between the Maya and Christian calendars. This would put 10:19:0:0:0 at 1464 A.D.

*Zacualpa* is a valuable, most painstaking and careful report. It suffers however from the attempt to make its conclusions easily digestible to a wide public. Fitting his findings into a larger picture should be the goal of every archaeological writer, but this report points up the limitations to doing so in a report on a single site. The reconstruction in Section I of a highly developed mountain-corn culture is interesting and ingenious, but left this reader with the feeling that our knowledge of Quiché economy provides as yet too thin a body of material to warrant such detailed analysis. Putting what is usually Summary and Conclusions into Section II, Historical Reconstruction, is an interesting idea but seems to lead to repetition and lack of emphasis. For example, the four phases of Zacualpa occupation are summarized three times, each time from a slightly different angle, and nowhere is there a comprehensive summary of prehistoric Zacualpa building technique.

It is needless to say a great satisfaction to me to have Dr. Wauchope's work bear out my conclusions based on Burkitt's field work and checked by my own in Alta Verapaz and Quiché in 1939–41. He has, however, in referring to my publication changed the period names Chixoy I–IV to Alta Verapaz I–IV. This gives a false impression of the material. I chose the name Chixoy because Burkitt's pottery came not only from western Alta Verapaz but also from eastern Quiché across the Chixoy River. Moreover, while Coban-Chamá material is typical of the western part of the Alta Verapaz, we do not yet know whether it is typical of the eastern.

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# NOTES AND NEWS

## ARCTIC

Last summer Henry B. Collins, representing the Smithsonian Institution, assisted by J. P. Michea, from the National Museum of Canada, excavated a number of old Eskimo sites on Resolute Bay, Cornwallis Island, at about 75 degrees North latitude. This was the first serious archaeological work in the northern Canadian Arctic Archipelago, an area which has been uninhabited within historic times. Ruins of four villages, with from 6 to 14 well-preserved Thule type houses of stone and whale bone were found. Excavations in the houses and adjacent middens yielded over 1000 specimens, all characteristic of the Canadian Thule culture. Bowhead whales and driftwood seem to have been abundant at the time of the Thule occupation, although they are completely absent from the region today. Of particular interest are a number of examples of pictographic art. The best specimen is a whalebone snow knife showing a whale being harpooned from an umiak. The boat carries a steersman, harpooner, and three paddlers. Other pictographs show realistically drawn caribou and geese. New to the Arctic was a composite stone and pottery lamp, with a flat limestone slab for a base and a built-up side of pottery.

Dr. Richard S. MacNeish conducted an archaeological survey along the Mackenzie River from Fort Providence to Norman Wells, and located a number of sites, some of sufficient importance to justify future excavation. He also examined the area along the east shore of Great Slave Lake, the barren lands east of Great Bear and Great Slave Lakes, and the area near Lake Athabaska. In these regions he discovered some 30 sites, many of which were associated with ancient beach levels. Three different, recurrent associations of artifact types were represented. Future work in the district should yield interesting and important results.

An archaeological reconnaissance of two rivers in northwestern Alaska was made by Ralph S. Solecki of the Smithsonian Institution last summer. The work was made possible by the U. S. Geological Survey in cooperation with the Office of Naval Research. Accompanying a field party of geologists, Solecki located 192 archaeological sites on the Kukpowruk and Kokolik rivers, from the foothills of the De Long Mountains to the Arctic Ocean at Point Lay. These sites consisted of villages, camps, and chipping stations. The latter were most in evidence. Two sites yielded material similar to that found at the University of Alaska campus site near Fairbanks, and included polygonal cores and lamellar flakes. The industry is like that which N. C. Nelson has significantly linked with Mongolia.

Last summer, Louis Giddings of the University of Alaska, with a second grant from the Arctic Institute of North America, continued his archaeological work at Cape Denbigh in Norton Sound, Alaska. He was assisted by Mr. and Mrs. Wendell Oswalt and carried on excavations at both Nukleet and Iyatayet. At Nukleet, the more recent, permanently frozen site, a large rectangular area was excavated to bed rock, exposing superimposed Eskimo house remains and quantities of well-preserved artifacts of organic materials. Among these are logs and wooden utensils suitable for treering dating, large woven grass mats, a complete coiled basket, and effigy figures or dolls of wood, bark, antler, and ivory. The oldest material from the bottom of the mound appears to be closely related to the Early Punuk or Birnirk cultures. The upper layers at Iyatayet contained material closely related to that from Nuklett. The lower layers, however, consist of clays in which were found flint artifacts closely resembling those of the Point Hope Ipiutak culture. Below these culture-bearing clays, and separated from them by a sterile layer of laminated, sandy clay, was a thin bottom deposit characterized by new forms of chipped flint and obsidian. This oldest complex, represented by nearly one thousand artifacts, contains burins like the straight, angle, and beaked forms known from the Old World. There are also lamellar flakes and diagonally retouched derivatives of these flakes, as well as types known best from Folsom or Yuma horizons of the western states. Among these latter are a fluted point of chalcedony, and a broken blade of the type known as "oblique Yuma." Analysis of soil samples from the layers that separate this complex from the Eskimo culture layers above may give some indication of the age of the deposit, although unfortunately organic material is almost completely absent from the bottom stratum.

During the past summer, Dr. Helge Larsen, assisted by Charles E. Lucier, conducted archaeological investigations at several sites on the Seward Peninsula, Alaska. The project was sponsored by the Danish National Museum and the University of Pennsylvania Museum. The first site was a village mount at Cape Spencer. Although the bulk of the material was late Eskimo, thin layers at the bottom of the deposit contained artifacts which closely resembled those of the Point Hope Ipiutak culture, and which evidently belong to a hitherto unknown phase of that culture. An ulo and a knife with iron blade indicate that iron was more common here than at the classic Ipiutak site, whereas only one piece of chipped flint was found. The sculptural art is reminiscent of Ipiutak art and the Siberian animal style, but the surface decoration is scratchy and of inferior quality. Two elaborate ivory carvings of Ipiutak type, which had been found near Cape Spencer the previous year by David Hopkins of the U. S. Geological Survey, had evidently come from a grave half a mile north of the site. The grave yielded parts of three skeletons, an artificial ivory eye, and the top piece of a mask-like set of carvings, indicating close relationship with Point Hope Ipiutak culture. The second site excavated was at the airfield at Deering. Artifacts from the north edge of the field belong to the Western Thule culture. On the southern edge of the field were found the remains of a large house with walls of heavy horizontal logs and artifacts of flint, antler, ivory, and wood, identical with those from Ipiutak. The third site was a limestone cave at Trail Creek, 30 miles inland from Deering. Deposits outside and inside the cave yielded artifacts representing several phases of Eskimo culture, from recent to Ipiutak. Below the Ipiutak level in the cave were remains of what may be a pre-

Eskimo culture. These include lamellar flakes and very slender arrowheads (?) of antler with long, deep grooves for side blades. Excavations at Deering and Trail Creek will be continued next summer.

Dr. William Laughlin and Gordon H. Marsh, assisted by Fred A. Milan, returned last summer to the Aleutian Islands for serological, ethnological, linguistic, and archaeological researches. Excavations were made at a Late period site on Clam Lagoon, Adak; at Nikolski on Umnak; and at Murder Point on Attu. At Nikolski, where Hrdlička had excavated and where the party had worked the previous summer, the stratigraphic sequence of two major periods of occupation was confirmed. All primary linguistic, physical, and cultural affiliations of the Aleutian population lie with the Eskimo, and there were two major cultural periods and two morphological types involved in the peopling of the Aleutian Islands. The Pre-Aleuts are today represented in the western Aleutian populations, and the division of the chain into eastern and western administrative units by the Russians in 1826 appears to recognize this distinction between east and west. Although all three dialects of Aleut are mutually intelligible, the westernmost or Attu dialect seems to be closer to Eskimo proper. Among the distinguishing characteristics of the Pre-Aleut artifacts is their asymmetrical shape. Labrets and ground stone artifacts occurred only in the upper levels at Nikolski. It was also proved that many types, such as the sea-otter harpoon with long foreshaft and small point, lack archaeological depth and belong to a complex of traits which was moving into the Aleutian chain from the east at the time the islands were discovered by the Russians.

A party from the University of Michigan, consisting of A. C. Spaulding, W. R. Hurt, and A. Miller, excavated in a village site on Agattu Island in the western Aleutians. Ted P. Bank, also of the University of Michigan, explored and collected specimens from several burial caves in the Aleutian chain.

Dr. Douglas Leechman of the National Museum of Canada examined a site near Winnipeg where a large bone implement, made from the fibula of a mammoth or mastodon, had been found. He investigated a number of archaeological sites in central British Columbia, and collected several hundred stone artifacts which appear to be related to the culture discovered by Frederick Johnson and by Leechman in southern Yukon Territory. He also examined sites along the Alaska Highway between Teslin and Whitehorse. Turning south, he worked with Dr. Carl Borden, of the University of British Columbia, on the excavation of a kitchen midden at Boundary Bay, some 20 miles south of Vancouver. Approximately 380 artifacts and 13 skeletons were removed.

Last summer, Dr. Frederica de Laguna, supported by a grant from the Arctic Institute and a fellowship from the Viking Fund, conducted a preliminary archaeological and ethnological survey of the northern Tlingit area. She was assisted by Eward Malin and William Irving. The party worked in the territory of three tribal groups: the Yakutat, or northernmost Tlingit, the Chilkat-Chilkoot on Lynn Canal, and the Angoon tribe on Admiralty Island. As compared with archaeological sites of the southwestern Eskimo, those of the Tlingit are much smaller and contain a smaller proportion of shells. Villages were located on beaches favorable to the landing and launching of large canoes and usually command an extended view, although they are not necessarily at or very near a salmon stream. In the Angoon area a number of steep-sided rocky islands or headlands served as forts. The rapid growth of the forests and the raising of the land two feet or more as a consequence of the earthquake of 1899 makes it difficult to find and to work these sites. The most important discovery made by the expedition was that the original population of Yakutat was Eyak, not Tlingit, and that the Tlingit language and social organization were introduced by immigrants from southeastern Alaska in pre-Russian days. Aside from the building of large plank houses set in shallow excavations and the careful depositing of rubbish in trash mounds behind the houses (or, alas, in the sea), the archaeology of the Yakutat area seemed remarkably similar to that of the Chugach Eskimo of Prince William Sound in late prehistoric times. Further work is necessary to confirm this impression.

According to Dr. Douglas Leechman, Miss Catharine McClellan continued her ethnological studies in the southern Yukon in the area where the coastal Tlingit people are in contact with the interior tribes. Informants at Teslin, Carcross, and Klukshu were interviewed, and a large volume of notes, photographs, and tape records of songs was collected. (*F. de L.*)

## PACIFIC COAST

Six regular field parties of the Department of Anthropology and the University of California Archaeological Survey of the University of California during the summer of 1949 carried out archaeological investigations in 18 sites, worked in 15 counties, recorded 150 hitherto unknown archaeological sites, excavated 109 prehistoric burials, and deposited about 30,000 archaeological specimens in the Museum of Anthropology. An aggregate of 1305 man-days of work were spent, 32 persons in all being engaged in archaeological work. Many of the students participated in two or three of the investigations. There were two volunteer workers, from San Francisco State College and Harvard University, and the following institutions collaborated: California Historical Society; University of California; Santa Barbara College; Stanford University; and the Institute for Nuclear Studies, University of Chicago.

From August 15 to September 8, Mr. Clement Meighan, graduate student in Anthropology at the University of California (Berkeley), was in charge of an archaeological crew which reexcavated the Estero shell mound at Drake's Bay in search of additional Caucasian artifacts deriving from the Spanish galleon *San Agustin* of Sebastian Cermeño, which was wrecked there in November, 1595. A total of 27 pieces of Ming and Wan Li porcelain and 4 iron ship's spikes were recovered.

A summer session field class under the direction of R. F. Heizer, assisted by Mr. Allan Miller, worked from June 20 to July 31 at site Sac-6 near Franklin, on the Cosumnes River. This large site was used as a training ground where students received instruction in contour mapping, excavating techniques, burial exposure and removal, and the like.

Site survey crews were dispatched locally with the result that 60 hitherto unrecorded sites were noted. The central problem attacked by the group was an inquiry into the precise nature of the physical constituents of 10 Consumnes River refuse midden deposits. The material from a total of 35 pits, each 5 by 5 feet and dug in 12-inch levels, was screened through a one-half inch sieve. All screenings were then washed, sun dried, and hand sorted to isolate baked clay, rock, freshwater mussel shell, unworked animal bone, obsidian flakes, and artifacts. These items were then weighed and the weights recorded. Artifacts were recorded by number of pieces of each class within a 12-inch level. Particular care was taken to select village sites which were situated in specific environmental relationships. Thus, open valley plain, swamp and lakeshore margins, river bank, and rolling foothill sites were tested. It is obvious from the varying amounts of different components caught by the screen that measurable differences in quantity of animal food, rock, etc., there are from one site to another. The amount of material recovered is so extensive that it will take some time to work up the results, and toward this end six of the students are engaged in a semester's laboratory research under the guidance of S. F. Cook and Heizer preparing the report. It is anticipated that new insight will be gained into the daily life of the prehistoric occupants of the Cosumnes River region. This experiment, at any rate, represents in California a new approach to the reconstruction of life in the past. Sections of the crew were detached for five days at a time and taken to Bodega Bay where they assisted the University of California Archaeological Survey in the excavation of the large Middle Horizon shellmound (Son-299).

A six weeks field trip (June 24 to August 8) was made in the northern district of Baja California by William D. Hohenthal and William S. King, graduate students at the University of California. Hohenthal continued ethnographical investigations among the Southern Diegueno, Paipai, and Kiliwa Indians begun during the summer of 1948, and King conducted an archaeological survey in the area of these three groups. Over 1000 miles of the back country were covered by jeep, and a fairly good picture of the site pattern from the Pacific Ocean to the San Felipe Desert was gained. Pottery-producing sites were found to increase in size and number as the eastern desert was approached. In the northwest area, especially in the Valle de Nejí and in the small canyons south of Tecate, the majority of pottery-producing sites yielded surface evidences of Caucasian manufactures. A number of pure lithic sites were discovered in the large interior valleys, the Valle de las Palmas, Valle de Santa Clara, and Valle de San Rafael all having such sites. Petroglyphs were found in the region of San Matias Pass, which joins the mountainous country with the San Felipe Desert. Permission for the survey was given by the Mexican Government through Dr. Eduardo Noguera, Director of the Departmento de Monumentos Prehispanicos.

A Department of Anthropology field party spent seven weeks (June 14 to August 3) salvaging archaeological data from a mound included in the Concha Loma Realty development at Carpinteria, Santa Barbara County. J. Bennyhoff was in charge, and A. Mohr, J. Lofler from the University, and J. Akzam from San Francisco State College participated in the excavation. Remains of two cultures were uncovered. Manos, metates, hammerstones, and abundant core tools of the scraper and chopper variety formed the bulk of the artifacts from the lower levels of the midden. Net sinkers, asphalted stones, chipped blades, and a small quantity of worked bone tools completed the inventory. Most artifacts were coated with a calcareous deposit. Two cemeteries near the subsoil base produced 24 burials in varied positions: 10 dorsal extended, 8 semi-flexed, 2 ventral extended, 2 semi-extended, 1 flexed, 1 reburial. North or south orientation was characteristic. Artifact associations were minimal, the most noteworthy being killed metates, small spire-lopped olivella beads, whole unworked shells, pigment, bone beads, and the following unique forms: projectile point, bone pendant decorated with punctate design, mica and steatite beads. Two types of probable charmstones came from the cemetery areas. The material culture shares some traits with the horizon called Oak Grove by D. B. Rogers and P. Orr, though the mortuary complex from Concha Loma deviates from that outlined by these authors.

The upper levels yielded both hopper and bowl mortars, pestles, side notched and stemmed projectile points, a few core tools, net sinkers, chipped blades, some bone and shell work, asphalted stones, and chipped crescent. Rock accumulations outlined on oval house pit (15 by 13 feet) with a central fireplace surrounded by segments of a well preserved floor. One flexed burial was found just beneath the house floor. The second culture agrees well with descriptions by D. B. Rogers of the Hunting horizon.

An emergency excavation was carried out by the University of California Archaeological Survey at a large and important shell mound on Bodega Bay, Sonoma County, when it was learned that the owner planned to level the site in connection with land improvement. This work was directed by Franklin Fenenga, assisted successively by F. A. Riddell and A. R. Pilling.

The excavation, which lasted from June 20 to August 14, consisted in cutting a 25 feet wide trench completely across the site. This sample represents approximately 10 per cent of the total mound mass. The sample seems to have been adequate and representative. Only a single cultural manifestation was represented by the 10 feet deep midden, that of the McClure Facies of the Middle Horizon. The quantity of information and material obtained will permit a much more definitive description of this culture than was previously possible.

During most of July and part of August, F. Riddell and W. Evans worked in the vicinity of Honey Lake Valley, Lassen County, California, making an archaeological site survey. A total of 75 sites was located, most of them being surface desert sites, but many have considerable depth of deposit as well as a relatively large over-all size. A surface collection was made, totaling about 1,000 specimens. These specimens, however, consisted of the heavier types of stone tools, most of the finer material having been gleaned from the surface of the various sites by local collectors. Local surviving Indians were visited by Riddell and Evans to get information on names and locations of historic villages and

names and use of various archaeological specimens found during the site survey.

Mr. John Mills, graduate student at the University of California, was in charge of excavations (August 5 to 31) at the site of the former village of Tsurai in Trinidad Bay, Humboldt County, California. This village was discovered in 1775 by the Hezeta expedition, visited repeatedly in the early nineteenth century by sea otter fur traders, and came under full Caucasian impact in 1850 when the town of Trinidad was established. The refuse deposits range from 4 to 8 feet in depth, the upper historic level dating from 1850–1916 clearly delimited from the lower level. Calculations of the ratio of historic-prehistoric refuse deposits result in a date of *ca.* 1600 for the founding of the village. This date is consistent with other indications of the antiquity of northwestern California archaeological cultures.

Additional excavation was carried out here by the University of California Archaeological Survey with the view of salvaging information before the site is destroyed in a real estate development project.

A. Mohr spent 15 days in August studying archaeological sites in the Inyokern Naval Ordnance Test area. A dry cave, previously disturbed by vandals, yielded a number of projectile points of Amargosa type. Petroglyphs are numerous, and some data on sequence of styles on the basis of superimposition and differential weathering were gathered. Eighteen open and petroglyph sites were found and are assignable to the Pinto, Amargosa, and "Shoshonean" cultures. Mohr's work was done in collaboration with the University of California Archaeological Survey.

Mr. Arnold L. Pilling has succeeded F. Riddell as Assistant Archaeologist of the University of California Archaeological Survey. Dr. Gordon W. Hewes, formerly of the University of North Dakota, has joined the staff of the Department of Anthropology, University of Southern California.

M. R. Harrington reports that Dr. George Brainerd of the Southwest Museum and U.C.L.A. has returned from a six months' trip to Yucatan and Campeche, where he studied the stratigraphic sequence of Maya pottery types in a series of sites lying between the central and northern Maya areas. This work was sponsored by the Carnegie Institution of Washington.

The older site records of the Archaeological Survey Association of Southern California are being transferred to uniform site cards.

The second season of the Southwest Museum's archaeological excavations at the Pinto site at Little Lake, Inyo County, terminated August 1. Six graduate students of U.C.L.A. took part during July, this work constituting an official field session of the university. This was made possible by the recent appointment of Curator M. R. Harrington of the Museum, who was in charge of the expedition, as Research Associate in the Department of Anthropology and Sociology. Two more Pinto house sites, outlined by postholes, were located, the largest being circular and about 12 feet in diameter. Many Pinto points were found, together with a few of Lake Mohave and Silver Lake types. Implements, such as scrapers of various kinds, gravers, and crude metates and manos were abundant.

Douglas Osborne, Pacific Coast director of the River Basin Survey Program, reports that during the early part of the summer the office at Eugene, under his direction, completed a final report on the excavations of 1948. This report was abstracted for mimeographing and distributed to co-operating agencies. In the latter part of June, Osborne was informed by Dr. Allen Smith of the Department of Sociology and Anthropology of Washington State College at Pullman, that the State College had granted him a sum, a little in excess of $1000, for archaeological research. He suggested that this be combined with the Smithsonian contributions to make possible a larger River Basin Survey excavation. In the latter part of July, excavations were begun in the lower part of McNary reservoir near Cold Springs, Oregon. Osborne visited the excavations several times but during his absence the work was under the direction of Mr. Joel Shiner, a graduate student of U.C.L.A. Shiner tested some seven sites and excavated rather extensively in one, 35-Um-7. At this latter site, he discovered buried shell middens and a generally rather thin midden, which often extended to a depth of 7 feet. In this older midden were found house pits, which are probably of rather recent date. The artifacts associated with the buried shell middens and with the deeper midden, generally were of basalt and of different types than those found last year in association with historical materials. Since the end of excavation in early September, Shiner has remained in charge of the laboratory in Eugene and has been working up the summer's data. Osborne resigned from the River Basin Surveys in September and is now Curator and Instructor in the Department of Anthropology, University of Washington.

Carrol Burroughs, University of Washington, reports that the fourth Annual University Summer Field Session worked from June 21 to August 20. A group of students under Burroughs tested the remnants of four midden sites on San Juan Island and partially excavated a fifth site; the purpose of the excavations was to obtain information on these sites before they were completely destroyed through erosional forces and human activity. Preliminary examination of the artifacts and food remains of the sites suggests that four of the five were seasonal camp sites at which specific types of food were collected; material from the fifth site suggests a more permanent occupation, perhaps a village site. Field reports, plans, profiles, and materials are available for study at the Department of Anthropology in Seattle.

Warren Caldwell, graduate student from Stanford University, partially excavated a midden site on the spit at Jekyll Lagoon on San Juan Island. Occupation of the site appears to have been seasonal, with clamming and fishing as the major activities. His field report and collections are at Seattle.

Dr. Charles Borden of the University of British Columbia conducted a joint University of Washington-University of British Columbia excavation at a midden site at Point Roberts, Washington. The party excavated a trench through a shell ridge deposited at the edge of a former lagoon. The excavation revealed that the ridge of midden material, several hundred yards long and about a hundred feet wide, was based on the sandy beach of the lagoon and

built up to a height of about twelve feet above the original beach. Twelve burials were recovered. Plans are in progress to continue excavation of this Point Roberts site next year, again as a joint project.

Miss Florence Howard, University of Washington undergraduate, did an archaeological survey of a section of southwestern Puget Sound. In line with the policy of this University, Miss Howard located and mapped sites, gathered information from local inhabitants, photographed local collections, and tested the larger sites for strata information and representative material.

Two undergraduate students of the University, Malcolm Forbes and William Liston, did archaeological work at two sites on Lopez Island in the San Juan group during the fall quarter. They tested the remnants of a large site at Richardson from which a large local collection has been gathered, and began excavation of a shell mound at McKay Harbor. John Campbell, undergraduate, made an archaeological survey of a portion of the Columbia River above Priest Rapids during the fall quarter.

Burroughs reports that the Washington Archaeological Society was organized in November. One purpose of the society is to organize interested nonprofessionals and to employ their efforts in an over-all attack on the study of the prehistory of the state.

Phil C. Orr of the Santa Barbara Museum of Natural History reports that Mr. Ralph Colcord has completed the classification and cross-filing of the Channel Island collections, which was begun several years ago. Each shell and bone artifact has been classified according to Gifford's classificatory system. Mr. Colcord is starting now on the Mainland collections, which will be treated in the same way. Miss Margaret C. Irwin attended the International Congress of Americanists held in New York City. Richard S. Finley and Phil C. Orr are preparing for the Third Santa Rosa Island Expedition. They plan to excavate at Skull Gulch in a site where 27 well preserved house pits are present. The Museum cooperated with Miss Paquita del Reye of the Old Spanish Days in Santa Barbara committee, who, with the aid of members of the Boy Scouts, Order of the Eagle, staged a very colorful and interesting revival of the Swordfish Dance of the Canalinos.

The Tranquillity site, Fresno County, earlier reported on by G. W. Hewes as possibly producing evidence of the contemporaneity of man and extinct animals, and subsequently excavated by L. Satterthwaite, was visited in July by L. C. Eiseley, R. A. Stirton, and E. W. Gifford. Probably only a great deal of additional excavation here will definitely settle the problem of contemporaneity or non-contemporaneity of man and Pleistocene mammals.

Malcolm Farmer of the San Diego Museum of Man reports a salvage excavation in the city of San Diego which produced tools of the San Dieguito and La Jolla cultures. Farmer hopes to report on this and other salvage jobs in the near future. The Museum is reorganizing its archaeological site file and is setting up the cross-index of site location cards to assist in the identification of sites reported to it.

The principal archaeological work of the Kern County Museum in recent months has consisted of a survey of old Yokuts village sites on the shores of Kern Lake. One site which has produced a large quantity of surface artifacts for local collectors and which has been badly pot hunted, was "excavated" by sweeping the top surface, collecting the sweepings in 800 gunny bags, and screening the material. A power-driven screen is now being assembled for use in screening the earth excavated from the cemetery areas. This work, according to F. F. Latta, Director of the Museum, will be carried out in the spring. Another project of the Museum is the construction of a Pioneer Village in a 13-acre plot surrounding the Museum. An Indian village, constructed some years ago by local Indians and now stored, will be set up as a part of the Pioneer Village project. (*R. F. H.*)

## SOUTHWEST

During the 1949 field season the Southwest Expedition of the Chicago Natural History Museum under the leadership of Dr. Paul S. Martin and with the assistance of Dr. John B. Rinaldo resumed investigations in the Pine Lawn Valley near Reserve, New Mexico. The work accomplished included the excavation of three additional pueblo sites and four neighboring pit house structures, as well as the continuation of the survey of the Cochise loci on Wet Leggett arroyo. The results of the expedition may be summed up as follows:

1. The further definition of the Reserve Phase by the excavation of the small pueblos mentioned above.

2. The discovery of a sub-surface jacal-like structure underneath one of the masonry pueblo structures. This jacal-like structure may represent an intermediate architectural stage in this area between pit houses and surface masonry structures.

3. Further study by Dr. Ernst Antevs of the soil profiles on the Wet Leggett and other arroyos and the collection of several more Cochise implements.

4. The discovery of a Cochise camp site, including an occupation floor and several artifacts, beneath the refuse of one of the Reserve Phase pueblos and separated from it by a sterile layer half a meter thick.

5. Excavation of a small oval "pit house" over 7.5 feet deep, which had been used as a refuse dump by the neighboring pueblo. The roof beams were supported in wall sockets rather than by the usual posts.

The University of Utah is planning a small (26 case) museum dealing exclusively with Utah anthropology. A sum of money adequate for the employment of a preparator and for the construction of exhibit cases has recently been approved by the Board of Regents, and exhibit construction was scheduled to begin on or about January 1. The opening of the exhibit hall will occur some time in the spring as one of the special events of the University of Utah Centennial year. A student, Miss Sara Sue Price, is being employed as a part-time museum assistant, primarily on the cleaning, cataloging, and general systemization of the big archaeological collection which was moved to the anthropology building last year.

Of special interest to Americanists generally is the research project of Dr. Charles E. Dibble, who, in collaboration with Dr. Arthur J. O. Anderson of the School of Ameri-

can Research, is continuing translation and re analysis of Sahagún's *Historia General de las Cosas de Nueva España*. This research has been underway for approximately one year. Drs. Dibble and Anderson have already translated Book I of Sahagun, which deals with the Aztec gods, their dress, their attributes, and their devotees, and this has been printed as a bulletin of the School of American Research for distribution approximately December 1, 1949.

During the months of September and October, a mobile survey crew, composed of graduate students Robert D. Stirland and Jack Rudy, conducted an archaeological reconnaissance of the Virgin River headwaters in Washington County, Utah. Particularly intensive work was done in the area which will be inundated by the construction of the proposed Virgin or Lower Gunlock reservoirs northwest and northeast of Utah, respectively. Within the reservoirs themselves, approximately 27 sites were encountered. Location data and collections were obtained from a total of approximately 72 sites. Test excavation was carried out in 7 sites within the reservoir limits of the Gunlock Reservoir. The low-lying sites near the river were interesting if not spectacular. Small L-, U-, or D-shaped unit houses were formed by very small rooms. The stones of the walls were evidently not carefully coursed, judging from the limited amount of surface debris. Stone was used to raise the walls only one or two feet. Room floors were normally sunken only a few inches into the ground. Apparently the wall stones were laid upon the current surface for one or two crude layers or courses; the remainder of the room was then built of timbers or wattle and daub. This latter technique is assumed; the assumption rests upon evidence from the Virgin Reservoir, where there is a large amount of debris from burned wattle and daub structures. At a site which was extensively sampled by Ben Wetherill a few years ago, no evidence of jacal construction was observed. In some of the deeper rooms, large slabs of stone were used for either floor or wall liners or both. On the higher mesas adjacent to the Virgin River, there are unit dwellings showing carefully coursed masonry and other evidence of greater recency. It is hoped that the detailed analysis of the survey data will justify more extensive work in the area.

There will also be, during the winter months, an attempt to write a preliminary report of the material recovered from three caves in the Wendover region, which were sampled by the summer field school party. The preliminary analysis of this material indicates that one of the caves bears marked resemblances to the Great Basin caves to the west. Another, reported by Elmer R. Smith several years ago as U-145, has yielded specimens appearing to bear much stronger relation to the Deadman Cave material reported by Elmer R. Smith in 1941, than to the caves farther west.

## NORTHERN MISSISSIPPI VALLEY

The third season of a joint expedition conducted by the Illinois State Museum and the University of Chicago took place in the Starved Rock area, La Salle County, Illinois, June 20 to August 20, 1949. The excavations were carried out by 25 student archaeologists from the University of Chicago, Columbia University, the University of Toronto, Syracuse University, Hamilton College, College of the City of New York, and Wellesley College under the direction of Dr. Kenneth G. Orr, Department of Anthropology, University of Chicago. Dr. and Mrs. Robert Braidwood, of the University of Chicago, were guest directors during the time Dr. Orr observed "couvade" before and after the birth of a baby daughter.

The excavations took place at five sites within and immediately adjacent to the Starved Rock State Park. Three sites, Starved Rock, Old Hotel Plaza, and French Canyon, had been partially excavated during the 1948 season. The Simonson and the Council Cave sites were new ventures for the expedition. The Simonson site contained the Box Elder Mound previously excavated by Kinietz for the University of Illinois in 1931. The Starved Rock site, located on a sandstone promontory overlooking the Illinois River, yielded further data on a non-pottery complex (the Starved Rock culture) occupying the lowest level. Burials associated with artifacts of the Fisher culture, Corbin Farm pottery, and artifacts of the Heally and La Salle cultures were found along with large postholes thought to represent the palisade of Fort St. Louis. The expedition cooperated with an excavation of the Illinois State Division of Architecture also on the Starved Rock site, which was under the direction of Mr. Richard Hagen, a graduate student at the University of Chicago.

The Old Hotel Plaza site, located on a talus of sand on the west side of Starved Rock, contained cache pits and burials of two historic cultures: one affiliated with the Fort Ancient Aspect (La Salle), and the other a Late Woodland culture (Tonti). French Canyon, a ravine to the east of the rock, contained the much eroded remnant of a stratified site which yielded Early and Middle Woodland pottery capped by a prehistoric Fisher-Heally culture (Lovers' Leap). The Simonson site at the west end of the park was a Hopewell site consisting of burial mounds and some village area debris. Council Cave, a large sandstone cave at the east end of the park, presented evidence of excellent stratigraphy. Tests here showed the presence of a late culture at a depth of approximately 3½ feet below the top sand layer.

The final reports on the Starved Rock area are being prepared for publication at the University of Chicago.

Irvin Peithman of Southern Illinois University Museum and Thorne Deuel made a surface survey of two sites in southern Illinois known or thought to have been occupied by Indians since 1600. The "Nigger Springs" site near Shawneetown reported to have been inhabited by Shawnee is said to have been a source of salt for their domestic use and for trade. The second site near the mouth of the Kaskaskia River is documented as a village of the Kaskaskias from about 1700 to 1832.

Both groups mentioned lived also in the vicinity of Starved Rock in La Salle County, where joint parties of the Illinois State Museum and the University of Chicago have been excavating for the past four field seasons. It is hoped that further investigation of the southern Illinois sites will serve to identify two of the manifestations in the northern county.

The Department of Archaeology, Ohio State Museum, conducted explorations in two reservoir areas, Cowan Creek

and Delaware Dam, this past summer. In the Cowan Creek Reservoir, a large Adena mound, 18 feet high and 87 feet in diameter at the base, was excavated. A total of 18 burials were recovered, 17 from the mound and one in a sub-floor tomb. Most of the burials were in log tombs; a few lacked formal preparation.

Found beneath and to one side of the mound was a circular house site pattern, measuring 45 feet in diameter. The pattern consisted of paired posts averaging 1½ feet between pairs and 4½ feet between adjacent pairs. Found on the floor (exterior and interior) of the house were fragments of clay vessels, broken bone awls, needles, pigweed seeds, hickory nuts, fresh-water mussel shells, and animal remains. A single burial was encountered in a large sub-floor tomb in the center of the house. Placed with the remains were 2 copper bracelets and 120 flat, disk-shaped shell beads.

In the Delaware Dam area, just north of Delaware, Ohio, a large ossuary located on a glacial kame was excavated. The remains of some 60 individuals in bundles, which had been placed in a pit measuring 10 feet by 7 feet, and 3½ feet deep, were recovered. In addition to the remains, 4 stemmed projectile points, 2 fresh-water pearls, 1 large shell bead (salt water), 1 incomplete fresh-water shell gorget, 4 tubular copper beads, 2 thumb-nail scrapers, and fragments of charred cloth were also recovered. The explorations were under the general direction of Raymond S. Baby, Curator of Archaeology, assisted by Robert Goslin.

John C. McGregor reports: "With a small grant from the Graduate Research division of the University of Illinois, two trips were made to an interesting Hopewell site on the Illinois River. One trip last spring was in the way of an exploratory session, and this fall another trip of three days was made to work again. The site is a village site, and we have been digging in the trash of the village in the hope of accomplishing two things. First, to get a stratigraphic series of pottery types which I then hope will tie into the work I did at the Illinois State Museum in studying the material from the Havana site which was dug by Richard MacNeish. So far, in going over it, it looks as though it will do just that. We have been able to get a good sample of sherds and a number of other things, including a platform pipe, bone awls, etc. The other thing we hoped to do was find a house structure. So far all we have found is burned clay from what must have been a house, but are not able to pin it down. We will try to make one more trip to the site this fall, probably about Thanksgiving vacation, with more students to see if we can hit the thing."

According to Lloyd A. Wilford of the University of Minnesota, field work was conducted as follows: "Nearly a month was spent at Mille Lacs Lake, the late prehistoric center of the Dakota tribes. The problem was to find stratigraphic evidence of the age of the smooth surfaced ware of the Malmo Focus of the Mille Lacs Aspect relative to the age of the cord-wrapped paddle surfaced ware of the Kathio Focus of that aspect. In five village sites 20 feet by 10 feet rectangles were dug by levels and all dirt was screened. One proved to be predominantly Malmo, associated with stemmed points, and the others Kathio, associated with triangular points, but no obvious stratigraphy was found, unless study of the materials may reveal some percentage differences.

"At a site on Calhoun Lake, near Willmar, Minnesota, a rectangle and a mound were dug. This site was known to have been a regular camping place of the historic Dakotas nearly a hundred years ago and it was believed that the pottery would be of the late prehistoric and early historic Dakota. The site is a sandy blow-out area and was much poorer than surface materials indicated. The mound was sterile except that two artifacts were found 2 feet below the original ground level and may have had no association with the mound.

"Near Detroit Lakes two mounds were dug at a site on the Ottertail River. A large one yielded four unerupted first molars associated with a large and complete but badly cracked pottery vessel. A small mound had a subsoil pit with three skeletons one above the other. The highest was a primary burial, head to north, the lowest a primary burial, head to south. Between them was a bundle burial, oriented on an east-west axis.

"A village about 15 miles up the Ottertail proved to be rather rich with much pottery and with triangular points predominating. Pottery seemed to be largely of Kathio type, but there were sherds unlike any Mille Lacs sherds. An intrusive Cambria sherd in a lower level suggests that early stages of this site are contemporary with the earliest Mississippi of southern Minnesota.

"Another rich village site in southwestern Minnesota yielded a distinct stratigraphy. In the plowed area, there was a mixture of Woodland and Great Oasis sherds, but only Woodland was below. In both levels the points were predominantly stemmed. Some of the sherds from this site seem exotic in Minnesota, and further investigation will be made. The site was once a flat island in a lake that is now extinct, and it now resembles a miniature mesa. It is near Slayton in Murray County." (*R.G.M.*)

## SOUTHEAST

T. M. N. Lewis, University of Tennessee, reports the acquisition in the fall of three large archaeological and ethnological collections. One of these is an extensive collection of European trade goods excavated from documented Creek and Cherokee sites. Included are silver gorgets in both kidney and circular forms, various silver and brass ornaments, glass beads, iron implements and weapons. There are also "Southern cult" objects from eastern Tennessee sites. Several hundred late Mississippi pottery vessels are included.

Another archaeological collection has been donated by a Memphis citizen of Danish extraction. Among the specimens are a number of Danish Neolithic ground stone and chipped flint artifacts which were obtained from the Royal Danish Museum. The balance of the collection consists of Southeastern artifacts and pottery, including some of the notable human effigy head vessels from the Arkansas area.

A fine collection of Navaho and Pueblo items has been received. It was assembled by an army officer during the early 1890's and consists of outstanding examples of nineteenth century Navaho weaving, Moqui baskets, and other

materials. Madeline Kneberg was elevated to the rank of full professor on July 1.

A new Department of Anthropology and Archaeology has been formed at Florida State University, Tallahassee, with Hale G. Smith being appointed Acting Chairman and Acting Director of the Florida State University Museum, which contains the John and Mary Carter Peruvian collection. The program in Anthropology offers, during the fall quarter of 1949, a course in General Anthropology and a special course in museum techniques. The university hopes to expand the department in the future in order to include subjects in all fields of Anthropology and to establish an extensive research program.

This is not the first time Anthropology has been taught at F.S.U., as Dr. Raymond Bellamy, Head of the Department of Sociology, has for 32 years been teaching various courses in Anthropology. Dr. Bellamy, a graduate of Clark University, was a student of E. Stanley Hall. The newly formed Department of Anthropology is a continuation of his work and can boast of the fact that F.S.U. has the longest history in the Southeast of presenting courses in Anthropology. The collection of John and Mary Carter in the museum includes ceramic, bone, shell, metal, wood, and textile specimens from various cultural horizons in Peru. The Nazca vessel collection is outstanding. Mr. George Martin-Vague has prepared an article on these vessels for publication in the December issue of the *American Journal of Archaeology*. The University plans to expand the present museum facilities and to build an archaeological and ethnological museum which will specialize in Circum-Caribbean culture.

The 1949 Florida Legislature split the functions of forests and parks, and Florida Park Service archaeology is now included in the new Board of Parks and Historic Memorials. John W. Griffin has been occupied with the preparation and editing of various papers, and with working out interpretive and other plans for historic (including archaeological) monuments under the new program. Ripley P. Bullen conducted excavations at the Johns Island site on the central Florida west coast, and at a small burial mound near Gainesville. Reports on these excavations have been prepared and await publication. The majority of the work for 1950 will be concentrated on sites and periods from which the Park Service either now possesses examples, or proposes to acquire examples in the near future, as well as on inaugurating interpretation of certain sites now in its possession.

Reports on stratigraphic tests conducted in 1948–49 by the Natchez Trace Parkway Archaeological Survey at Emerald (Selsertown) and the Anna mound groups, Adams County, Mississippi, have been prepared by John L. Cotter, National Park Service archaeologist. Publication will be sought when supplementary notes have been completed.

Field work was continued at the Gordon mound and village site, Jefferson County, Mississippi, in September, 1949. Located on Coles Creek, and hitherto considered a "Coles Creek site," many elements at Gordon Mound A have been found to bear interesting relationships to both the Emerald and Anna test data. By November, Mound A had been over half excavated, revealing much scattered and disrupted human skeletal material at the mound base overlying a precedent village zone richly productive in sherd and animal-bone midden material. A second mound and a village area on the Parkway right-of-way will be tested before current operations are concluded. Laboratory processing of field materials is being done at Natchez Trace Parkway Headquarters, Tupelo, Mississippi.

At the University of Mississippi, anthropology has been added to the Department of Sociology. William G. Haag has joined the staff there and is currently making a survey of sites in the northern portion of the state. Next summer a field course will be offered and the excavation of a village site in Lafayette County is planned.

Carl F. Miller, of the River Basin Surveys, made a reconnaissance of the Bayou Bodcau project in northwestern Louisiana-southwestern Arkansas. Frank H. H. Roberts reports that Miller and Joseph R. Caldwell will continue excavations at Etowah, in the Allatoona Reservoir, Georgia, until mid-winter. By November about 20 sites had been excavated or tested.

Excavation of the "large-log townhouse" mound on the Cumberland River in the Wolf Creek Reservoir of southern Kentucky continued throughout the summer of 1949. About one-half the site is now completely excavated. W. S. Webb is presently preparing a manuscript on the important Parrish site of western Kentucky. He has in press the report on certain shell heaps of Butler County, Kentucky. (*W.G.H.*)

## SOUTH AMERICA

*Puerto Rico.* In 1947, An Archaeological Research Center was established at the University of Puerto Rico, as part of the Humanities, with the purpose of initiating an intensive study of the archaeological problems of the West Indies' area. Among the projects that the Archaeological Research Center is now engaged in is the preparation of an archaeological map of Puerto Rico and a catalogue of the Puerto Rican archaeological material found in United States museums.

Two archaeological excavations have been made in Luquillo (1947) and in Loiza (1948). The material gathered has been deposited in the archaeological collections of the University of Puerto Rico Museum.

*Brasil.* Mr. Clifford Evans, Jr. and Betty J. Meggers (Mrs. Evans) submit the following account of their Lower Amazon Expedition. This work was financed and supported by the Viking Fund, Inc. and by a Cutting Fellowship from Columbia University, New York.

The last phase of field study was completed in May of 1949 with a one-month excavation of mounds on central Marajó Island. Twenty village mounds associated with one cemetery mound were surveyed and excavated in the Igarapé Os Camutins, in the headwaters of the Rio Anajas; the three other mounds of the Monte Carmelo Group along the Rio Anajas were also investigated.

Before leaving Brazil in July of 1949, Evans and Meggers had spent several months in actual classification and description of all sherd material. Classified and typed samples of materials were left in the Museu Nacional, Rio de Janeiro, the Museu Goeldi in Belem, and in the Museu Territorial of the Territory of Amapá for future comparative purposes. Samples of the types were also brought to the States for incorporation with study collections of South American ce-

ramics. It should be stated that local Brazilian cooperation, both official and particular, was excellent and whole-heartedly given.

Analysis of the material and seriation of all the strata cuts indicates the presence of six separate phases of occupation in the islands of Marajó, Mexicana, and Caviana, and two additonal phases in the Territory of Amapá, with evidence of only one of the other phases having first occupied the Territory of Amapá and then migrated to the islands. The archaeological data extends from historical times (archive data on the Aruã) backward through the various occupations of the phases. The elaborate, well-known Marajó Mound-Builder phase is an intrusive culture into the mouth of the Amazon limited to the central part of Marajó with traditions totally different from any of the other phases.

The editor of this sub-section would like to call special attention to this survey of Evans and Meggers. For decades Americanists have known and talked of Amazonian archaeology and of Marajó, Maracá, and Santarem styles. Nothing existed, however, except a minimum of descriptive information. Now, in 1949, we have our first distributional and chronological data from this important region of the Amazonian delta. It is hoped that Evans and Meggers, as well as other archaeologists from both the United States and from Brazil, may be able to follow up this promising beginning for establishing a time-space framework for the prehistory of the Amazonian basin.

*Colombia*. The Colombian government's Instituto Ethnológico y Servico de Arqueología continues its large scale program of archaeological surveys in that country. Under the general directorship of Sr. Luis Duque Gomez work has recently been carried out in the following regions:

Dr. Rafael Reyes Parga made excavations in Sibaté, Cundinamarca. Dr. Reyes' finds supplement other work on the problem of Chibchan archaeology carried on by the Instituto in the last few years.

Srta. Blanca Ochoa Sierra and Joaquín Parra Rojas conducted an archaeological survey in the Department of Magdalena and also worked at the important and well-known site of Pueblito. Studies at this last site, which have been continuing for some months under the immediate supervision of Sr. G. Reichel D., reveal new ceramic types, hitherto not described for the Santa Marta area.

At the National Archaeological Park of San Agustín recent emergency excavations revealed a rich tomb of the San Agustín culture.

The Colombian Instituto is also cooperating with Dr. Emil Haury of the University of Arizona who is undertaking archaeological investigations in Colombia this fall and winter. Dr. Haury, who received a Guggenheim Fellowship for this field work, is collaborating with Sr. Cubillos of the Instituto staff. Dr. Haury has initiated his work at Facatativa, near Bogotá and reports that "we're running a deep trench into a rock shelter on the long shot that there may be something under a relatively thin Chibcha layer."

*Venezuela*. Dr. José María Cruxent R. has carried out an extensive survey of Venezuela, making surface collections and sample pits. He has recently been visiting universities in the United States.

*Peru*. Mr. Richard Schaedel continues his work as director of the Instituto de Antropología in Trujillo. He is engaged in clearing the wall arabesques at the Huaca Dragón near Trujillo, and in an elaborate survey of architecture of the north coast valleys based on selected sections of the serial survey photographs.

The Viru Valley Program of the Institute of Andean Research reports the following monographs in preparation:

BENNETT, WENDELL C. *The Gallinazo Group, Viru Valley, Peru* (Yale University Publications in Anthropology, No. 43, in press).

BIRD, JUNIUS B. *Preceramic Cultures in Chicama and Viru Valleys, Peru* (American Museum of Natural History, Anthropological Papers).

COLLIER, DONALD. *Stratigraphic Excavations in the Viru Valley, Peru* (Fieldiana: Anthropology, Chicago Natural History Museum).

FORD, JAMES A., and GORDON R. WILLEY, *Surface Survey of the Viru Valley, Peru:* Part 1, Viru Valley: Background and Problems by James A. Ford and Gordon R. Willey; Part 2, Cultural Dating of Prehistoric Sites in Viru Valley, Peru by James A. Ford (American Museum of Natural History, Anthropological Papers, Vol. 43, Pt. 1, in press).

HOLMBERG, ALLAN R., and JORGE C. MUELLE *Fiesta and Siesta in a Peruvian Town* (Publications, Institute of Social Anthropology).

STRONG, WILLIAM DUNCAN, and CLIFFORD EVANS, JR. *Cultural Stratigraphy in the Viru Valley, Northern Peru: The Formative and Florescent Epochs* (Columbia Studies in Archeology and Ethnology, Vol. 3, in press).

WILLEY, GORDON R. *Prehistoric Settlement Patterns in the Viru Valley, Peru* (Smithsonian Miscellaneous Collections).

*General*. The Institute of Andean Research held an interim meeting for 1949 at the Hotel Pierre, New York City on September 6th. The Palenque and other projects were discussed. Dr. Emil Haury, University of Arizona, was made a Research Associate for the coming year. Chairman Kidder presided. The following were present: Secretary Ekholm, members Kidder II, Lothrop, Bennett, Kroeber, Rowe, McCown, Bird, Gillin, Strong, Collier, Willey, Holmberg, Tschopik, Mason. (*G.R.W.*)

## THE LOON'S NECKLACE

A 16 mm. sound film in Kodachrome, entitled The Loon's Necklace, is now ready for distribution by Encyclopaedia Britannica Films Inc., 1150 Wilmette Avenue, Wilmette, Illinois.

It is based on a well-known Indian legend of the Pacific Northwest which explains how the loon got his necklace. The version on which the moving picture script was based was written by me in such a way that all the characters could be played, not by people, but by West Coast Indian masks.

This film not only received high honours at the Edinburgh Folklore Festival last year but was awarded the first prize this year for the best film produced in Canada in 1948. It runs ten minutes, and will be found particularly suitable for class-room work in folklore and art. It is available for sale ($90.00) or rental. In Canada it is available through The Canadian Education Association, 206 Huron Street, Toronto 5, Ontario. (*Douglas Leechman.*)

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